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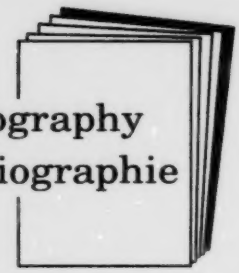

Canada Water Act

Publications

relatives à la Loi sur les ressources en eau du Canada

1970 - 1990

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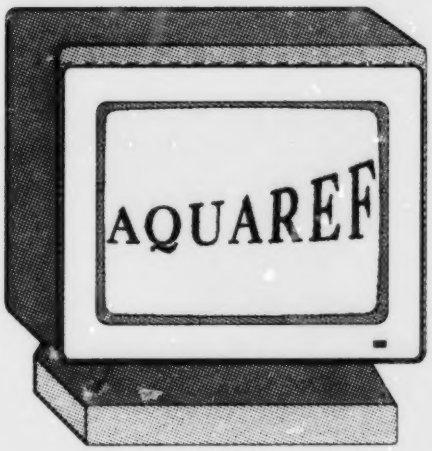

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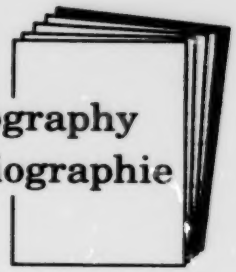

Canada Water Act

Publications

relatives à la Loi sur les ressources en eau du Canada

1970 - 1990

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FOREWORD

AVANT-PROPOS

The Canada Water Act of 1970 ushered in a remarkable period in the evolution of Canada's approach to the planning and development of freshwater resources. Since the promulgation of the Act, the concept of water resource management has evolved in many respects: from short-term planning to long range; from single-purpose to comprehensive, taking into account all water uses and water-related activities; from local planning to planning that encompasses the river basin requiring intergovernmental cooperation. Moreover, the public is playing a larger part in water management decisions.

Documented here is a fascinating range of cost-shared federal-provincial-territorial activities from coast to coast and in the North; at the end of this publication, an in-pocket map will be helpful in locating past and current activities under the Act. With this and a separate bibliography to be published on the Flood Damage Reduction Program, all Canada Water Act documents will now be easily accessible and on a permanent basis. It is our hope that these bibliographies will stimulate interest and facilitate research in the field of water resource management.

La Loi sur les ressources en eau du Canada de 1970 a marqué le début d'une période remarquable dans l'établissement de l'orientation canadienne en matière de planification et de mise en valeur des ressources en eau douce. Depuis la promulgation de la Loi, le concept de la gestion des ressources hydriques a évolué à bien des égards: il est passé d'une planification à court terme vers une à long terme, d'une gestion à but unique vers une à buts multiples qui tienne compte de la totalité des utilisations de l'eau et des activités liées à cette dernière, d'une planification locale à une planification globale du bassin de la rivière nécessitant une collaboration intergouvernementale. À cela s'ajoute le fait que le public participe maintenant davantage à la prise de décisions relatives à la gestion des eaux.

La présente bibliographie fournit un éventail fascinant d'activités de cofinancement réalisées par les gouvernements fédéral, provinciaux et territoriaux d'un océan à l'autre et dans le Nord. La carte de la pochette à la fin de cette publication aidera le lecteur à situer les activités actuelles et passées réalisées en vertu de la Loi. Grâce à cette publication et à une bibliographie distincte à paraître sur le Programme de réduction des dommages causés par les inondations, il sera dorénavant possible d'avoir toujours accès facilement à tous les documents parus conformément à la Loi. Nous espérons que ces bibliographies susciteront l'intérêt et faciliteront la recherche dans le domaine de la gestion des ressources en eau.

Le Directeur de la planification et de la gestion des eaux,

R.L. Pentland,
Director,
Water Planning and Management Branch

1991/03

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SECTION 1

WATER MANAGEMENT / GESTION DES EAUX

1. ANNUAL REPORTS / RAPPORTS ANNUELS

1.1 The Canada Water Act / Loi sur les ressources en eau du Canada

1 (079499)
ENVIRONMENT CANADA * ***The Canada water act : annual report*** = Loi sur les ressources en eau du Canada : rapport annuel * Environment Canada * 1973-

This series of publications corresponds to annual reports on operations under the Canada Water Act. First, the provisions of the Act are explained; then the activities under the Act are detailed in four parts. Part I gives the activities concerning comprehensive water resource management, federal-provincial cooperation, Interdepartmental Committee on Water, federal-provincial water resources management programs and water research. Part II corresponds to activities related to water quality management, Part III to regulating nutrient inputs, and Part IV to public information programs. Part III was incorporated into the Canadian Environmental Protection Act as a result of the Proclamation on June 30, 1988. Finally, the principal federal-provincial cooperative arrangements under the Canada Water Act are described. These include regulation, apportionment, monitoring and survey programs, water management programs and flood damage reduction program. The cooperative arrangements funded from sources other than the Canada Water Act are also summarized.

2 (F14186)
ENVIRONNEMENT CANADA * ***Loi sur les ressources en eau du Canada : rapport annuel*** = The Canada water act : annual report * Environnement Canada * 1973-

Cette série de publications correspond aux comptes rendus annuels des activités accomplies en vertu de la Loi sur les ressources en eau du Canada. Tout d'abord, les dispositions de la Loi sont expliquées, et les activités relevant de la Loi sont détaillées en quatre parties. La première partie donne les activités de gestion intégrée des ressources en eau, la collaboration fédérale-provinciale, le Comité interministériel de l'eau ainsi que les programmes fédéraux-provinciaux de gestion des ressources en eau et les recherches effectuées en vertu de la Loi. La seconde partie correspond à la gestion qualitative des eaux, la troisième partie à la réglementation des apports de substances nutritives, et la quatrième partie au programme d'information au public. La troisième partie a été incorporée à la Loi canadienne sur la protection de l'environnement par suite de la promulgation de la Loi, le 30 juin 1988. Enfin, chaque compte rendu se termine par les principaux accords fédéraux-provinciaux de collaboration dans le cadre de la Loi. Il s'agit essentiellement des programmes de régularisation, de répartition, de surveillance et de relevés des ressources en eau, des programmes de gestion des ressources en eau, ainsi que du Programme de réduction des dommages causés par les inondations. Les accords de coopération financés par des sources autres que la Loi sont également présentés.

1.2 Prairie Provinces Water Board / Régie des eaux des provinces des Prairies

3 (079494)
PRAIRIE PROVINCES WATER BOARD * ***Prairie Provinces Water Board : annual report*** * Prairie Provinces Water Board * 1969-

On October 30, 1969 Canada and the provinces of Manitoba, Saskatchewan and Alberta entered into an agreement to share the flow and to consider the quality of eastward flowing interprovincial streams. Under Schedule C of that Master Agreement on Apportionment, the Prairie Provinces Water Board was reconstituted and was given the responsibility to administer the Agreement. The Board, the Committee on Hydrology, the Committee on Water Quality, the Committee on Groundwater and the Committee on Interjurisdictional Agreements Administration meet throughout the year. The annual reports summarize the activities and the progress of the Prairie Provinces Water Board, its Committees, and the Secretariat for each fiscal year. The Master Agreement on Apportionment is included in each annual report.

1.3 Mackenzie River Basin Committee / Comité du bassin du fleuve Mackenzie

4 (081371)
Mackenzie Basin Intergovernmental Liaison Committee : annual report, 1975-1976 = Comité de liaison intergouvernementale du bassin du Mackenzie : rapport annuel, 1975 à 1976 * 1976? * v, 8p

The purpose of this report is to inform the governments and the general public who are concerned about the Mackenzie Basin of the Liaison Committee's activities since publication of the previous report. This report covers the period from January 1, 1975 to March 31, 1976. In the report the terms of reference of the Committee are presented, as well as the members of the Committee, and the activities covered by the previous report are summarized. The current activities of the Liaison Committee are described; these were centered on the editing and publishing of the Reference Binder. The activities of the Task Force on Information and the activities of the Ad Hoc Task Force are presented, as well as the activities of the Task Force on Program Development. The members of the three task forces for the period 1975-1976 are presented.

5 (F14413)
Comité de liaison intergouvernementale du bassin du Mackenzie : rapport annuel, 1975 à 1976 = Mackenzie Basin Intergovernmental Liaison Committee : annual report, 1975-1976 * 1976? * v, 8p

Ce rapport annuel a pour objet de renseigner les gouvernements et le public intéressés sur les activités du Comité de liaison dans le bassin du Mackenzie pour la période allant du 1er janvier 1975 au 31 mars 1976. Le rapport présente le mandat du Comité ainsi que ses membres, résume les sujets traités dans le rapport précédent et détaille les travaux actuels du Comité de liaison. Ces derniers ont porté essentiellement sur la révision et la publication d'un ouvrage de référence sur le bassin du Mackenzie. Ensuite, on trouve dans le rapport un résumé des travaux du Groupe d'étude de l'information, des travaux du Groupe d'étude spéciale et du Groupe d'étude sur l'élaboration des programmes. Les membres des trois groupes sont cités.

6 (081372)
Mackenzie Basin Intergovernmental Liaison Committee : annual report, 1976-1977 = Comité de liaison intergouvernementale du bassin du Mackenzie : rapport annuel, 1976 à 1977 * 1977? * v, 16p

This third annual report contains information on the Liaison Committee's activities and information exchanges concerning the Mackenzie Basin throughout the period from April 1, 1976 to March 31, 1977. It also summarizes previous activities in an appendix. First, current activities of the Liaison Committee and the Task Force on Program Development are presented with their respective members. Then, the provincial activities in Saskatchewan, Alberta and British Columbia are detailed. Federal activities in the basin are supervised by the Department of Indian and Northern Affairs, Fisheries and the Environment, and the Ministry of Transport. Cooperative activities include the Peace-Athabasca Delta project, the Flood Damage Reduction Program and Alberta Oil Sands Environmental Research Program. The appendix gives information on the history and terms of reference of the Liaison Committee, as well as the activities covered by the first and second reports.

7 (F14414)
Comité de liaison intergouvernementale du bassin du Mackenzie : rapport annuel, 1976 à 1977 = Mackenzie Basin Intergovernmental Liaison Committee : annual report, 1976-1977 * 1977? * v, 16p

Ce troisième rapport annuel a pour objet de renseigner sur les activités et les échanges d'information touchant le bassin du Mackenzie au cours de la période allant du 1er avril 1976 au 31 mars 1977. En appendice, on trouve également le sommaire des activités antérieures. Tout d'abord, on présente les activités récentes du Comité de liaison intergouvernementale et du Comité d'étude sur l'élaboration des programmes, ainsi que leurs membres respectifs. Ensuite, on détaille les activités provinciales et fédérales dans le bassin. Des activités provinciales ont eu lieu en Saskatchewan, en Alberta et en Colombie-Britannique. Les activités fédérales ont été entreprises par le ministère des Affaires indiennes et du Nord, par le ministère des Transports, ainsi que par Pêches et Environnement Canada. Des activités conjointes ont également été entreprises. En appendice, on trouve l'historique de la création du Comité de liaison intergouvernementale du bassin du Mackenzie, son mandat, ainsi que les travaux couverts dans les deux premiers rapports.

8 (044515)
Mackenzie River Basin Committee : annual report 1977-1978 * 1978 * 17p

This report reviews the activities of the Mackenzie River Basin Committee from April 1, 1977 to March 31, 1978. A section on information exchange reviews 35 provincial, territorial, federal, and cooperative activities taking place in the Mackenzie River Basin, most of which are located on the map.

9 (048589)
Mackenzie River Basin Committee : annual report, 1978-1979 * Mackenzie River Basin Committee * 1979 * 25p

This is the fourth annual report on the activities and information exchanges between various government departments involved with the Mackenzie River Basin. This report covers the period from April 1, 1978 to March 31, 1979. History, previous activities and Terms of Reference of the Mackenzie River Basin Committee are summarized in the Appendix. The main report contains current activities and programs of

the Committee and the information exchange. The information section is divided into provincial activities, territorial activities and federal activities in the basin.

10 (081373)
Mackenzie River Basin Committee : annual report, 1979-1980 = Comité du bassin du fleuve Mackenzie : rapport annuel, 1979-1980 * 1980? * v, 34p

This sixth annual report presents the activities of the Mackenzie River Basin Committee for the period from April 1, 1979 to March 31, 1980. The report highlights the organization of the Committee, the mechanism and activities of the Information Exchange Program, and the structure, the progress to date and the future study plans of the Mackenzie River Basin Study program. Information in the appendix includes the history and terms of reference of the Mackenzie River Basin Committee, provincial, federal, territorial and cooperative activities, and details on the study program. A map shows the location of the main activities in the basin.

11 (F14415)
Comité du bassin du fleuve Mackenzie : rapport annuel, 1979 à 1980 = Mackenzie River Basin Committee : annual report, 1979-1980 * 1980? * v, 38p

Ce sixième rapport annuel présente les activités du Comité du bassin du fleuve Mackenzie pour la période allant du 1er avril 1979 au 31 mars 1980. On y décrit la mise sur pied du Comité, le mode de fonctionnement et les points saillants du Programme d'échange d'information, ainsi que la structure, l'état des travaux en cours et les études futures du Programme d'étude du bassin du fleuve Mackenzie. En annexe, on trouve un historique du Comité, une description de son mandat, ainsi que les activités provinciales, territoriales, fédérales et conjointes effectuées dans le Programme d'échange d'information. Une carte permet de localiser les principales activités dans le bassin.

12 (081374)
Mackenzie River Basin Committee : annual report, 1980-1982 = Comité du bassin du fleuve Mackenzie : rapport annuel, 1980-1982 * 1982? * vi, 20p

This seventh report on the activities of the Mackenzie River Basin Committee covers the two-year period from April 1, 1980 to March 31, 1982. The report highlights the activities of the Committee and summarizes the study completed and study results of the Mackenzie River Basin Study program. The report presents a water resource overview of the Mackenzie River Basin, based on regular exchange of information among the jurisdictions represented. The water resource overview includes hydroelectric power, mining, oil and gas, Beaufort Sea, transportation, forestry, acid rain, flood control and flood damage reduction, environmental protection and biological studies. This report marks the successful completion of the Mackenzie River Basin Study.

13 (F14416)
Comité du bassin du fleuve Mackenzie : rapport annuel, 1980 à 1982 = Mackenzie River Basin Committee : annual report, 1980-1982 * 1982? * vi, 20p

Ce septième rapport annuel des activités du Comité du bassin du fleuve Mackenzie porte sur une période de deux ans, allant du 1er avril 1980 au 31 mars 1982. Ce rapport donne les grandes lignes des activités du Comité durant cette période et résume les études récemment complétées dans le bassin. Les projets de mise en valeur et les activités relatives aux ressources en eau sont également présentées, notamment la production d'hydroélectricité, l'exploitation des mines, du pétrole et du gaz, l'exploration dans la mer de Beaufort, les activités de transport et de foresterie, la lutte contre les inondations et les pluies acides, la protection de l'environnement et les études biologiques. Ce rapport marque la fin de l'étude sur le bassin du fleuve Mackenzie.

14 (071182)
Mackenzie River Basin Committee : annual report, 1983-1984 = Comité du bassin du fleuve Mackenzie : rapport annuel 1983-1984 * Mackenzie River Basin Committee * 1984? * 12p

This report highlights the activities and achievements of the Mackenzie River Basin Committee and presents an overview of resource activities in the Mackenzie River Basin. Recommendations arising from the Mackenzie River Basin Study Report are listed and the implementation status of each is reported. Highlights of information exchanged by the member agencies cover the following topics: hydroelectric power, mining, oil and gas development, environmental monitoring and fish studies in the Beaufort Sea, transportation, acid rain, flood control and flood damage reduction, biological studies in the Northwest Territories and conservation studies.

15 (069385)
Mackenzie River Basin Committee : annual report 1985-1986 * 1986? * vi, 17p

This report highlights the activities and achievements of the Mackenzie River Basin Committee and presents an overview of the water resources activities in the Mackenzie River Basin, based on the regular exchange of information among the governments represented. An update is presented on the status of the implementation of recommendations of the 1981 Mackenzie River Basin Study Report. An overview of water resources activities highlights such water-related resources such as fish and wildlife, and water-related topics such as mining, hydroelectric power, energy exploration and development, transportation, acid rain and flooding.

16 (076401)
Mackenzie River Basin Committee : annual report, 1986-1987 * 1987? * 23p

This twelfth annual report on the activities of the Mackenzie River Basin Committee covers the period

from April 1, 1986 to March 31, 1987. The report highlights the activities and achievements of the Committee and presents an overview of water resource activities in the Mackenzie River Basin based on the regular exchange of information among the governments represented (Canada, British Columbia, Alberta, Saskatchewan, Yukon, and Northwest Territories). These resource activities include hydroelectric power, mining, oil and gas, forestry, Beaufort Sea/Mackenzie River and Delta, transportation, acid rain, flood damage reduction, biological studies, and conservation and planning studies. Activities toward implementation of the recommendations contained in the 1981 Mackenzie River Basin Study Report are also outlined.

17 (081375)
Mackenzie River Basin Committee : annual report, 1987-1988 * 1988? * vii, 26p

This thirteenth annual report on the activities of the Mackenzie River Basin Committee covers the period from April 1, 1987 to March 31, 1988. The report highlights the activities and achievements of the Committee. It also presents an overview of water resource activities in the Mackenzie River Basin, based on the regular exchange of information among the governments represented. This overview includes hydroelectric power, mining, oil and gas, forestry, Beaufort Sea, transportation, acid rain, flood damage reduction, biological studies, and conservation and planning studies. Finally, the report puts emphasis on the implementation of nine recommendations contained in the 1981 Mackenzie River Basin Study Report.

1.4 Ottawa River Regulation Planning Board / Commission de planification de la régularisation de la rivière des Outaouais

18 (076406)
OTTAWA RIVER REGULATION PLANNING BOARD * ***Annual report 1983-84*** = Rapport annuel 1983-1984 * Ottawa River Regulation Planning Board, Hull, Que * Feb 1985 * 34p

This report summarizes the activities of the Ottawa River Regulation Planning Board, the Ottawa River Regulating Committee and subcommittees of the Board for the year ending March 31, 1984. This first annual report of the Board highlights its efforts toward an integrated management of the Ottawa River Basin with the goal of providing protection against flooding along the Ottawa River and its tributaries particularly in the Montreal region while maintaining the interests of the various users. A section is also included on the activities of the former Ottawa River Regulation Planning Committee during the period January 1981 to March 1983.

19 (F14417)
COMMISSION DE PLANIFICATION DE LA RÉGULARISATION DE LA RIVIÈRE DES OUTAOUAIS * ***Rapport annuel 1983-84*** = Annual report 1983-84 * Commission de planification de la régularisation de la rivière des Outaouais, Hull, Qc * févr 1985 * 37p

Ce rapport résume les activités de la Commission de planification de la régularisation de la rivière des Outaouais, du Comité de régularisation de la rivière des Outaouais et des sous-comités de la Commission, pour l'année se terminant le 31 mars 1984. Ce premier rapport annuel de la Commission met en évidence les efforts pour un aménagement intégré du bassin versant de la rivière des Outaouais. Cet aménagement a pour but de fournir une protection contre les inondations le long de la rivière et pour ses tributaires, spécialement dans la région de Montréal, tout en respectant les intérêts des usagers de la rivière. On trouve également dans le rapport un résumé des activités de la Commission précédente, pour la période allant de janvier 1981 à mars 1983.

20 (076409)
OTTAWA RIVER REGULATION PLANNING BOARD * ***Annual report 1984-85*** = Rapport annuel 1984-85 * Ottawa River Regulation Planning Board, Hull, Que * Feb 1986 * 18p

This annual report summarizes the activities of the Ottawa River Regulation Planning Board, the Ottawa River Regulating Committee, the Ottawa River Regulation Secretariat and subcommittees of the Board on establishment of modelling parameters, bylaws and procedures, and flood reserves, for the year ending March 31, 1985. During 1984-85, the Board has established a Secretariat, published a public information brochure on managing the waters of the Ottawa River, established liaison with the International St Lawrence River Board of Control at the policy and operating levels and continued a study on the feasibility and consequences of establishing flood reserves in some reservoirs.

21 (F14418)
COMMISSION DE PLANIFICATION DE LA RÉGULARISATION DE LA RIVIÈRE DES OUTAOUAIS * ***Rapport annuel 1984-1985*** = Annual report 1984-85 * Commission de planification de la régularisation de la rivière des Outaouais, Hull, Qc * févr 1986 * 20p

Ce rapport annuel résume les activités de la Commission de planification de la régularisation de la rivière des Outaouais et des sous-comités de la Commission, de même que celles du Secrétariat, pour l'année se terminant le 31 mars 1985. Les sous-comités avaient pour mandat l'établissement de paramètres de modélisation, la mise en application de règlements et de modalités, et la mise au point des réserves d'inondation. La Commission a instauré un secrétariat, publié une brochure d'information destinée au public concernant l'aménagement de la rivière des Outaouais, et

établi des liens avec la Conseil international de contrôle du fleuve Saint-Laurent. Au cours de cette année, on a également continué l'étude de faisabilité des réserves d'inondation dans certains réservoirs, ainsi que leurs conséquences.

22 (076408)
OTTAWA RIVER REGULATION PLANNING BOARD * ***Annual report 1985-86*** = Rapport annuel 1985-86 * Ottawa River Regulation Planning Board, Hull, Que * Feb 1987 * 18p

This report summarizes the activities of the Ottawa River Regulation Planning Board, the Ottawa River Regulating Committee, the Ottawa River Regulation Secretariat and subcommittees of the Board on establishment of modelling parameters, bylaws and procedures, flood reserves, and risk management, for the year ending March 31, 1986. During 1985-86, the Board pursued integrated management of the principal reservoirs during the spring flood period and implemented the use of flood reserves to enable operation of a dam in the Mille Îles River, started to improve the network of real-time precipitation gauges in order to increase the accuracy of hydrologic forecasts and formed a subcommittee to develop risk management methodology for the Ottawa River Basin.

23 (F14419)
COMMISSION DE PLANIFICATION DE LA RÉGULARISATION DE LA RIVIÈRE DES OUTAOUAIS * ***Rapport annuel 1985-1986*** = Annual report 1985-86 * Commission de planification de la régularisation de la rivière des Outaouais, Hull, Qc * févr 1987 * 20p

Ce rapport annuel résume les activités de la Commission de planification de la régularisation de la rivière des Outaouais, du Comité de régularisation de la rivière, et des sous-comités de la Commission, de même que celles du Secrétariat, pour l'année se terminant le 31 mars 1986. Ces sous-comités avaient pour mandat l'établissement de paramètres de modélisation, la mise en application de règlements et modalités, la mise au point de réserves d'inondation et la gestion du risque. La Commission a poursuivi ses travaux pour l'aménagement de réservoirs durant les inondations de printemps, et a mis en application l'usage de réserves d'inondation permettant le fonctionnement d'un barrage sur la rivière des Mille Îles. Cet aménagement du bassin versant a pour but d'améliorer le réseau de stations de jaugeage afin d'augmenter la précision des prévisions hydrologiques. Un sous-comité spécial a été formé pour développer une méthodologie de gestion du risque dans le bassin.

24 (076407)
OTTAWA RIVER REGULATION PLANNING BOARD * ***Annual report 1986-87*** = Rapport annuel 1986-87 * Ottawa River Regulation Planning Board, Hull, Que * Feb 1988 * 19p

This annual report describes the activities of the Ottawa River Regulation Planning Board, the Ottawa River Regulating Committee, the Ottawa River Regulation Secretariat and subcommittees of the Board on bylaws and procedures, flood reserves, risk management, and assessment of the impacts of flood reserves for the year ending March 31, 1987. Highlights include the Board's integrated management of the principal reservoirs during the spring flood period. Specific actions included the use of flood reserves to enable operation of a dam in the Mille Îles River and improvement of the network of real-time gauges in order to increase the accuracy of hydrologic forecasts. The Board also initiated an investigation into the problems caused by low flows and levels, and continued development of a comprehensive risk management model of the Ottawa River Basin.

25 (F14420)
COMMISSION DE PLANIFICATION DE LA RÉGULARISATION DE LA RIVIÈRE DES OUTAOUAIS * ***Rapport annuel 1986-1987*** = Annual report 1986-87 * Commission de planification de la régularisation de la rivière des Outaouais, Hull, Qc * févr 1988 * 21p

Ce rapport annuel résume les activités de la Commission de planification de la régularisation de la rivière des Outaouais, du Comité de régularisation de la rivière, des sous-comités de la Commission, de même que celles du Secrétariat, pour l'année se terminant le 31 mars 1987. Ces sous-comités avaient pour mandat la mise en application de règlements et modalités, la mise au point de réserves d'inondation, la gestion du risque et l'évaluation des répercussions des réserves d'inondation. Durant cette période, la Commission a poursuivi ses travaux pour l'aménagement des principaux réservoirs durant les inondations de printemps. Les activités comprennent notamment l'utilisation de réserves d'inondation permettant le fonctionnement d'un barrage dans la rivière des Mille Îles. L'aménagement du bassin versant a pour but d'améliorer le réseau de stations de jaugeage afin d'augmenter la précision des prévisions hydrologiques. La Commission a également fait une enquête sur les problèmes causés par les débits et niveaux d'étiage, et elle a poursuivi le développement d'un modèle complet de gestion du risque dans le bassin de la rivière des Outaouais.

1.5 Ottawa River Water Quality Coordinating Committee / Comité de coordination pour la qualité des eaux de la rivière des Outaouais

26 (072752)
Water quality in the Ottawa River : 1985 annual report of the Coordinating Committee for Water Quality in the Ottawa River to the Governments of Canada, Quebec and Ontario * Environment Canada, Inland Waters Directorate, Water Quality Branch, Ottawa, Ont; Environment Ontario, Southeastern Region, Kingston, Ont; Environnement Québec, Direction générale des ressources hydriques, Direction des relevés aquatiques, Ste-Foy, Qc * 1986 * 44p

The Coordinating Committee for Water Quality in the Ottawa River was formed in 1983 by the governments of Canada, Quebec and Ontario to coordinate the monitoring of the river by the three governments. This first annual report presents a résumé of progress since the previous assessment in 1981 and describes water quality conditions on the Ottawa River up to 1985. A description of water quality objectives, specific water quality concerns, remedial programs, coordinated monitoring and surveillance, follow-up to previous recommendations, federal and provincial legislation, and future work of the Committee, are presented.

27 (F12763)
Qualité de l'eau de la rivière des Outaouais : rapport annuel du Comité de coordination pour la qualité des eaux de la rivière des Outaouais présenté aux gouvernements du Canada, du Québec et de l'Ontario, 1985 * Environnement Canada, Direction générale des eaux intérieures, Direction de la qualité des eaux, Ottawa, Ont; Environnement Ontario, région du sud-est, Kingston, Ont; Environnement Québec, Direction générale des ressources hydriques, Direction des relevés aquatiques, Ste-Foy, Qc * 1986 * 47p

Le présent document vise à informer les divers gouvernements et le grand public des progrès accomplis par le Comité en matière d'objectifs. On y retrouve donc une évaluation de la qualité des eaux (ions, métaux lourds, oxygène dissous, matières organiques toxiques, etc.), un compte rendu de la qualité des eaux de la rivière par tronçon, un exposé des activités coordonnées de mesure et de surveillance ainsi que des objectifs en matière de qualité de l'eau, et un survol des programmes municipaux et industriels de lutte contre la pollution. Les auteurs traitent également de régularisation du débit, de flottage du bois, de dérivation et de production d'énergie. Les recommandations antérieures et le suivi sont exposés. Enfin, les législations fédérale et provinciales (Québec, Ontario) sont présentées.

28 (082253)
Water quality in the Ottawa River : second progress report of the Ottawa River Water Quality Coordinating Committee to Governments of Canada, Quebec, and Ontario 1989 * Environment Canada, Inland Waters Directorate, Water Quality Branch, Ottawa, Ont; Environnement Québec, Direction générale de l'assainissement des eaux, Ste-Foy, Qué; Environment Ontario, Southeastern Region, Kingston, Ont * 1989 * v, 31p

This second progress report of the Ottawa River Water Quality Coordinating Committee reviews progress made recently in controlling pollution from the forest industry and from municipal sources. It recommends further measures to control pollution from these sources. First, the highlights and recommendations are presented. Then, the developments in the forest industry (log drive and pulp and paper mill discharge), the municipal effluents and the monitoring are described. Special studies include synoptic survey, drinking water surveillance program, and survey of toxics in water and fish of the Ottawa River.

29 (F14592)
Qualité de l'eau de la rivière des Outaouais : deuxième rapport sur l'état des travaux du Comité de coordination pour la qualité des eaux de la rivière des Outaouais, présenté aux gouvernements du Canada, du Québec et de l'Ontario 1989 * Environnement Canada, Direction générale des eaux intérieures, Direction de la qualité des eaux, Ottawa, Ont; Environnement Québec, Direction générale de l'assainissement des eaux, Sainte-Foy, Qc; Environnement Ontario, Région du sud-est, Kingston, Ont * 1989 * v, 35p

Dans ce deuxième rapport sur l'état des travaux du Comité de coordination pour la qualité de l'eau de la rivière des Outaouais, on passe en revue les réalisations récentes dans la lutte contre la pollution causée par l'industrie forestière et les rejets urbains. De nouvelles mesures pour enrayer cette pollution sont également recommandées. Ce rapport présente d'abord les points saillants des réalisations. Ensuite, l'évolution de l'industrie forestière, les effluents urbains et les programmes de surveillance sont déterminés. Les études spéciales incluent un relevé synoptique de la qualité de l'eau, un programme de surveillance de l'eau potable, ainsi qu'un relevé des substances toxiques dans l'eau et dans les poissons de la rivière.

2. CANADA WATER BOOKS / ANNUAIRES DE L'EAU DU CANADA

30 (027486)
ENVIRONMENT CANADA * ***Canada Water Year Book 1975*** * Environment Canada, Ottawa, Ont * 1975 * 230p

Increasing uses of water are placing heavy demands on the quantity and quality of water available in densely populated areas of Canada. This first Water Year Book outlines the extent of these uses, discusses the conflicting demands for water and points to some of the future needs that must now receive consideration. Forthcoming editions of the Water Year Book will provide an updating of principal statistics on water and water-related events with greater emphasis to resources, research, and administration.

31 (F02511)
ENVIRONNEMENT CANADA * ***Annuaire de l'eau du Canada 1975*** * Environnement Canada, Ottawa, Ont * 1975 * 239p

Les utilisations de plus en plus grandes de l'eau contribuent à épuiser en quantité et en qualité l'eau destinée aux régions du Canada où la population est dense. Ce premier annuaire de l'eau, préparé par la Direction générale des eaux intérieures du Service de la gestion de l'environnement, expose ces diverses utilisations, étudie les besoins concurrents en eau et indique quelques besoins futurs que nous devons considérer dès maintenant.

32 (031344)
FISHERIES AND ENVIRONMENT CANADA * ***Canada Water Year Book 1976*** * Fisheries and Environment Canada, Ottawa, Ont * 1976 * 106 p

This document updates previously published water statistics and water-related events and places special emphasis on water resource planning and management in Canada. The first section, Water Planning and Management, covers administration, river basins, the Canada Water Act and recent major river basin studies including the Saskatchewan, Nelson, Okanagan, Saint John and Qu'Appelle. The Peace-Athabasca Delta project and the Lake Winnipeg, Churchill and Nelson rivers study are also described. The second section, Water Use and Development, includes topics on municipal and rural domestic water use, industrial use, agricultural use, inland fisheries, water transport, recreational use and electric power generation. The third section, Floods and Flood Control, concerns itself with the Federal Disaster Assistance Program, flood damages for the years 1974 and 1975, flood forecasting, flood control works, and the Flood Damage Reduction Program. The final section, Water Research, summarizes the work of research establishments - centres, institutes and laboratories - from across Canada. The topics are the pollution problem, measurement of pollution, fate of pollutants, pollution abatement, groundwater hydrology, ice, snow and socio-economic research.

33 (F02512)
PÊCHES ET ENVIRONNEMENT CANADA * ***Annuaire de l'eau du Canada 1976*** * Pêches et Environnement Canada, Ottawa, Ont * 1976 * 106p

Cette édition de l'Annuaire de l'eau du Canada est la deuxième d'une série de publications sur les ressources en eau douce du Canada. Le thème principal de cette édition est la planification et la gestion des ressources en eau du Canada. Bien que l'Annuaire de l'eau du Canada couvre les aspects les plus divers des ressources en eaux canadiennes, la présente édition constitue un résumé des instruments de gestion et de planification intégrée des eaux et insiste sur les programmes intergouvernementaux.

34 (036281)
FISHERIES AND ENVIRONMENT CANADA * ***Canada Water Year Book 1977-1978*** * Fisheries and Environment Canada, Ottawa, Ont * 1979 * 120 p

This edition of the Canada Water Year Book provides a brief report on the numerous water data monitoring programs. It provides some background on most programs, explains when and why the programs were initiated, how they are conducted, what types of data are available and where the data can be obtained. The edition is presented under the following main topics: 1) water data fills an important role in society; 2) Canada's water resources range between wide extremes; 3) basic programs for collecting water data, i.e. water in the atmosphere, snow and ice, rivers and streams, lakes and reservoirs, ground water, charting navigable waters, inventory of water pollutants; 4) information systems, WATDOC; and 5) water data of general interest, i.e. the Flood Damage Reduction Program, water power development, large water diversions in Canada and international programs, shore damage survey of the Great Lakes and Hydrological Atlas of Canada; and 6) water resources data research.

35 (F00970)
PÊCHES ET ENVIRONNEMENT CANADA * ***Annuaire de l'eau du Canada 1977-1978*** * Pêches et Environnement Canada, Ottawa * 1979 * 120p

Cette édition est la troisième d'une série de publications portant sur les eaux douces. Elle traite de données sur l'eau et fait état des programmes qui permettent d'obtenir ces données. On nous renseigne sur les masses d'eau souterraine et de surface, sur l'hydrographie, la pollution, l'utilisation de l'eau, ainsi que sur certains systèmes informatiques.

36 (079500)
ENVIRONMENT CANADA * ***Canada water year book 1979-1980 : water research edition*** * Environment Canada * 1981 * viii, 132p

This edition reviews the principal activities in water research across Canada in relation to physical processes in the aquatic environment, chemical and biological processes in the aquatic environment, water quality, water treatment and ultimate disposal, water quantity management, and water resources planning.

37 (F04232)
ENVIRONNEMENT CANADA * ***Annuaire de l'eau du Canada 1979-1980 : recherche sur les eaux*** * Environnement Canada * 1981 * 132p

Cette quatrième édition de l'Annuaire de l'eau du Canada passe en revue les principales activités de

recherche sur l'eau à travers le Canada. On traite de six sujets principaux, soit: les processus physiques dans l'environnement aquatique; les processus chimiques et biologiques dans l'environnement aquatique; la qualité de l'eau; l'épuration et l'élimination finale des eaux usées; la gestion des quantités d'eau; la planification des ressources en eau.

38 **(056232)**
ENVIRONMENT CANADA * ***Canada Water Year Book 1979-1980, references = Annuaire de l'eau du Canada 1979-1980, références*** * Environment Canada * 1981 * 69p

This publication provides references supplied by many of the authors contributing to the 1979-1980 Canada Water Year Book to document their findings and to help indicate some important areas of research related to their discipline. These references, arranged by chapter and section corresponding to the layout of the subject matter in the Year Book itself, are produced in English, French or German according to the language in which the original report was produced.

39 **(062305)**
ENVIRONMENT CANADA * ***Canada Water Year Book 1981-1982, water and the economy*** * Environment Canada * 1983 * 105p

This edition of the Canada Water Year Book is the fifth in the series reporting on freshwater resources in Canada. The first edition, for 1975, provided broad general coverage of Canada's water resources. The second, for 1976, looked in detail at water management in Canada. The third, for 1977-1978, dealt with water data and described the field, office and laboratory programs producing water data. The fourth edition, for 1979-1980, provided an overview on water research across Canada. Unlike the last few editions that have carried a special theme, this latest edition, for 1981-1982, deals with a large number of subjects, each with its own special message.

40 **(F09375)**
ENVIRONNEMENT CANADA * ***Annuaire de l'eau du Canada 1981-1982, l'eau et l'économie*** * Environnement Canada * 1983 * 105p

Cette édition de l'Annuaire de l'eau du Canada est la cinquième d'une série de publications consacrées aux ressources en eau douce du Canada. Contrairement aux dernières éditions consacrées à un thème particulier, l'édition de 1981-1982 porte sur un grand nombre de sujets, chacun d'eux apportant un message précis. À notre avis, le principal message de l'édition de 1981-1982 est révélé dans le chapitre d'introduction où il est souligné que l'eau est une ressource extrêmement précieuse, dont l'importance est croissante pour l'économie du Canada. Étant donnée l'abondance des ressources en eau dans tout le Canada, il a été difficile pour les Canadiens de prendre conscience du rôle vital que l'eau joue dans leur vie économique et sociale de tous les jours. Ce chapitre traite des problèmes auxquels sont confrontés les gestionnaires de l'eau, et de la vulnérabilité de l'eau aux abus de l'homme si aucun contrôle n'est mis en oeuvre. Il présente en outre les initiatives possibles en matière de planification et de gestion de l'eau qui permettront non seulement de résoudre de nombreux problèmes, mais offriront également des perspectives de développement économique. Dans les chapitres suivants, le lecteur pourra découvrir l'ampleur de l'utilisation de l'eau au Canada ainsi que les impacts causés par un excès d'eau (inondations) ou une pénurie (sécheresses). De plus, un exposé porte sur la mise en oeuvre de mesures destinées à améliorer la planification et la gestion des ressources en eau dans tout le Canada et le long de la frontière Canada-États-Unis. Le dernier chapitre aborde les questions connexes aux ressources en eau, d'intérêt courant, et met l'accent sur la participation du Canada aux programmes d'outre-mer sur les eaux douces.

41 **(070789)**
ENVIRONMENT CANADA * ***Canada Water Year Book, 1985 : water use edition*** * Environment Canada, Ottawa, Ont * 1986 * 98p

This edition on water use contains data derived from surveys of industry, agriculture, and municipalities. Water use is also examined with respect to energy generation, transport, fisheries and wildlife. A calendar of events is presented, with discussions of the Inquiry on Federal Water Policy, federal-provincial and international cooperation, and other water management activities. Significant meteorological and hydrological events in Canada in 1983 and 1984 are listed. Survey data from earlier years have been recalculated and appear with the latest data for 1981.

42 **(F12401)**
ENVIRONNEMENT CANADA * ***Annuaire de l'eau du Canada 1985 : utilisation des eaux*** * Environnement Canada, Ottawa, Ont * 1986 * 98p

Après une brève présentation des données relatives à l'eau au cours des années antérieures (1972-1981), ce document procède à un survol de l'utilisation de l'eau au Canada en 1981. Ainsi, le document fait état de l'utilisation de l'eau par les municipalités, dans l'industrie manufacturière, l'industrie minière, l'industrie de la thermoélectricité et en agriculture. Les transports par voie d'eau, la faune, les pêches et l'énergie obtenue de l'eau (hydroélectricité, énergie marémotrice, etc.) sont autant d'éléments importants réunis dans cet annuaire. Enfin, le document expose brièvement les lignes directrices relatives au choix et à l'intégration des rivières du patrimoine canadien.

SECTION 2

WATER MANAGEMENT POLICY / POLITIQUE RELATIVE À LA GESTION DES EAUX

3. FEDERAL WATER POLICY / POLITIQUE FÉDÉRALE RELATIVE AUX EAUX

3.1 Policy / Politique

43 (074206)
ENVIRONMENT CANADA * ***Federal Water Policy*** * Environment Canada * 1987 * 43p

The Federal Water Policy consists of an overall objective, two specific goals and five strategies or broad courses of action with protection and enhancement as well as realistic pricing and valuation of water as the dominant themes. The federal government proposes to use the five strategies of water pricing, science leadership, integrated planning, legislation, and public awareness to reach its stated goals and intends to be guided in its actions by the analysis of a selection of water concerns with implications for the federal government. Harmonious institutional arrangements for coordinating the efforts of the government concerned and their respective agencies are necessary for successful implementation of the policy. Statements of specific policy will be used to apply the five policy strategies. The range of concerns include toxic chemicals management, water quality management, groundwater contamination, interbasin transfers, water use in irrigation, flooding, native water rights, wetlands preservation, hydroelectric energy development, Canada-United States boundary and transboundary water management, interjurisdictional water conflicts within Canada, and safe drinking water.

44 (F12801)
ENVIRONNEMENT CANADA * ***Politique fédérale relative aux eaux*** * Environnement Canada * 1987 * 43p

Ce document a pour objet d'esquisser la politique fédérale relative aux eaux. Ainsi, le document expose d'abord les motifs d'une telle politique, puis la nature et les objectifs de la politique ainsi que les stratégies qui en découlent, soit la tarification des services d'eau, le rôle de direction en matière de sciences, la planification intégrée, la législation et enfin, la sensibilisation du public. La mise en oeuvre de la politique ainsi que des applications précises (gestion de la qualité de l'eau, inondations, navigation, etc.) sont également présentées.

4. INQUIRY ON FEDERAL WATER POLICY / ENQUÊTE SUR LA POLITIQUE FÉDÉRALE RELATIVE AUX EAUX

4.1 Publications of the Inquiry / Publications relatives à l'Enquête

4.1.1 Participation paper / Document pour la participation du public

45 (F14184)
COMITÉ D'ENQUÊTE SUR LA POLITIQUE FÉDÉRALE RELATIVE AUX EAUX * ***L'eau, question courante : document pour la participation du public*** = Water is a mainstream issue : participation paper * Enquête sur la politique fédérale relative aux eaux * 1984 * 24p

Le but de ce document est de donner au public les premières impressions du Comité d'enquête sur la politique fédérale relative aux eaux, de soulever les questions à approfondir et d'inviter tous les Canadiens à participer à l'enquête. Tout d'abord, le Comité présente les réserves du Canada en eau douce et les utilisations de cette eau. Ensuite, les problèmes de quantité et de qualité sont envisagés. Les questions de quantité englobent les pénuries d'eau et les inondations, les questions de qualité touchent les produits chimiques toxiques, les pluies acides, les effluents et les conflits d'utilisation. Dans la troisième partie du document, quelques questions liées à la gestion des ressources en eau sont abordées. Celles-ci comprennent notamment le rôle du gouvernement fédéral et sa politique actuelle, ainsi que des questions internationales et des projets de recherches hydrologiques. En conclusion, les membres du Comité tentent de présenter un bilan objectif de leurs observations. Le mandat du Comité, les lois et les admistrations fédérales relatives aux ressources en eau sont aussi présentés.

46 (079497)
INQUIRY ON FEDERAL WATER POLICY * ***Water is a mainstream issue : participation paper*** = L'eau, question courante : document pour la participation du public * Inquiry on Federal Water Policy * 1984 * 24p

This participation paper is an effort by the Inquiry on Federal Policy to share with the public the first impressions of the issues to be examined, to raise questions to be pursued, and to invite all Canadians to participate in the Inquiry. In the first part of the document, supply and use of fresh water are presented, while the second part deals with the quantity and quality issues. Quantity issues include both water scarcity and flooding; quality issues include toxic chemicals, acid rain, general effluent and conflicting demands. In the third part, some issues of water management are discussed. The development of the federal role and the federal water policy today are explained, as well as international issues and water research. The last part of the document gives a summary of the findings, and the members of the Inquiry are listed. As additional information, the Inquiry's terms of reference are presented with the federal legislation and administration relating to water.

4.1.2 Synthesis / Synthèse

47 (F12652)
Eaudiences : une synthèse des audiences publiques du Comité d'enquête sur la politique fédérale relative aux eaux = Hearing about water : a synthesis of public hearings of the Inquiry on Federal Water Policy * Environnement Canada, Ottawa, Ont * avril 1985 * 82p

Ce document décrit les questions, les problèmes et les solutions adressées au Comité d'enquête en matière de politique de l'eau. Ainsi, le document est subdivisé en cinq grands thèmes: la sûreté des approvisionnements (gestion de la demande, tarification de l'eau, abondance de l'eau, transferts entre bassins, etc.), la protection de la qualité de l'eau (traitement de l'eau, législation, protection à la source, eaux souterraines, précipitations acides, effluents urbains et industriels, etc.), le partage des ressources (rôle du gouvernement fédéral, administration des eaux nordiques, questions autochtones, relations canado-américaines, etc.) et la compréhension du problème (recherche, besoins, collecte de données, sensibilisation du public, etc.). Enfin, le document présente le mandat du Comité d'enquête et dresse la liste des participants et des membres du Comité.

48 (069827)
Hearing about water : a synthesis of public hearings of the Inquiry on Federal Water Policy = Eaudiences : une synthèse des audiences publiques du Comité d'enquête sur la politique fédérale relative aux eaux * Environment Canada, Ottawa, Ont * Apr 1985 * vp

This document describes the problems, issues and solutions put before the Inquiry on Federal Water Policy by an interested public and provincial, federal and territorial authorities through oral proceedings and written briefs and submissions. Areas discussed include emerging water issues in Canada, including their interjurisdictional dimensions; the balance of supply and demand and the prospect of maintaining clean water supplies for present and future generations; and assessment of the federal share in meeting Canada's needs in water research. Four broad categories of concern are identified throughout the presentations: deterioration and pollution of Canada's natural water quality resources; need for new approaches for planning use and development of Canada's water courses; need for a new approach to water resources management in an age of scarcity and constraint; and general lack of confidence in the existing framework of policy for managing Canada's water resources.

4.1.3 Final report / Rapport définitif

49 (069825)
PEARSE, P.H.; BERTRAND, F.; MACLAREN, J.W. * ***Currents of change : final report, Inquiry on Federal Water Policy*** * Inquiry on Federal Water Policy, Ottawa, Ont * 1985 * 222p

The federal government's role in water policy, the establishment of principles on which federal policy and programs should be based and development of a rational framework for the federal presence in water management are discussed. The report is divided into six parts: historical context in which federal water policy has evolved; picture of Canada's water resources, quantity, quality and geographical distribution; constitutional responsibilities of the federal government and the legal framework adopted to meet responsibilities in water management; current policies and programs in water management; unique importance of water resources in the northern territories; and the federal government's organizational structure for fulfilling its water management responsibilities focusing on the role of Environment Canada. The concluding chapter takes a retrospective view of the report's recommendations.

50 (F12431)
PEARSE, P.H.; BERTRAND, F.; MACLAREN, J.W. * ***Vers un renouveau : rapport définitif de l'Enquête sur la politique fédérale relative aux eaux*** * Comité d'enquête sur la politique fédérale relative aux eaux, Ottawa, Ont * sept 1985 * 257p

Ce rapport définitif découle des travaux que le Comité d'enquête a effectués non seulement pour s'acquitter de son mandat mais également pour améliorer la compréhension et mieux sensibiliser la population

aux possibilités et aux problèmes relatifs à la gestion des eaux. On décrit tout d'abord le contexte historique qui a donné le jour à la politique fédérale relative aux eaux. On brosse ensuite un tableau des ressources hydriques au Canada; on décrit les responsabilités constitutionnelles du gouvernement fédéral; on passe en revue la politique et les programmes actuels; on analyse l'importance particulière des ressources hydriques dans les territoires septentrionaux et on étudie la structure organisationnelle dont dispose le gouvernement fédéral pour exercer ses responsabilités dans le domaine de la gestion des eaux. En guise de conclusion, le Comité présente une brève analyse rétrospective de ses recommandations en regard des principes qui l'ont inspiré au départ.

4.2 Research papers / Documents de recherche

51 (069667)
RUEGGEBERG, H.; THOMPSON, A.R. * ***Water law in Canada : report on a workshop for the Inquiry on Federal Water Policy, Toronto, May 31 - June 1, 1984*** * Inquiry on Federal Water Policy, Ottawa, Ont * nd * 167p * (Inquiry on Federal Water Policy research paper, no 1)

This report summarizes the discussions and findings of a workshop in which sessions were organized around six major topics: basic water law in Canada; federal/provincial jurisdiction over water; interprovincial water management; water law in northern Canada; Indian rights to water on reserves; and international (Canada/United States) water law. Chapters are organized around these same topics. The last chapter brings together the recommendations generated in the workshop sessions and also summarizes the participants' views on what the federal government's role should be with respect to research on water law and management issues.

52 (069668)
HARE, F.K. * ***The impact of human activities on water in Canada*** * Nov 1984 * v, 102p * (Inquiry on Federal Water Policy research paper, no 2)

The paper offers an overview of the impact of the human economy on water quantity and quality. The pristine environment had intact forest or prairie cover, with low sediment and nutrient burdens in streams and lakes (though prairie sloughs were often clouded). Forest cutting has denuded slopes, thereby encouraging soil losses. Agricultural development has also led to increased sediment and nutrient loading of streams. Urban and industrial development has upset local drainage and added a large roster of toxic pollutants. The Great Lakes-St Lawrence system has seen recent reductions of phosphorus loading and a reduction in algal blooms, but toxic substances in sediments remain a problem. Acid deposition has also affected water quality. Future climatic change associated with carbon dioxide buildup will add to water demand and reduce supply in many areas. Great Lakes outflow is expected to decrease over the next half-century because of increased evaporation and increased consumptive withdrawals, especially by the US. Good water science already available is one of the keys to remedial action.(au)

53 (069669)
MACLAREN, J.W. * ***Municipal waterworks and wastewater systems*** * Jan 1985 * 50p * (Inquiry on Federal Water Policy research paper, no 3)

Persistent pollutants, especially toxic compounds, threaten some of the 2500 municipal water supplies in Canada, and provision must be made to protect these supplies including the provision of treatment or improved treatment where necessary. Many Canadian municipalities do not yet treat their waste water. More than 8 000 000 people reside in municipalities in Canada where no sewage treatment has yet been provided to protect the receiving waters and their other uses. Significant improvement in this situation is required. Substantial volumes of wastes reach the receiving waters of Canada from the overflows of combined sewers and storm sewers of municipalities during storm periods. These overflows are capable of better management for receiving water protection. Finally, the state of water and sewage works systems in Canada is deteriorating, especially in the portions buried below city streets, and significant rehabilitation programs are required to sustain these aging systems whose current replacement value is estimated at over $100 billion. All of the foregoing suggest the need for the federal government with the provinces to develop programs to catalyze municipal spending in these important areas.(au)

54 (069670)
GROVER, B.; ZUSSMAN, D. * ***Safeguarding Canadian drinking waters*** * Mar 1985 * v, 97p * (Inquiry on Federal Water Policy research paper, no 4)

The report provides an overview of the drinking water situation in Canada, with particular focus on water quality issues and the respective roles of various levels on government. Considerable background information is provided on the evolution of water supply and wastewater systems, the health implications of changes in drinking water quality, the legislative and regulatory framework and relevant programs of the federal government. Experience in the USA, which has had a Safe Drinking Water Act since 1974, is reviewed. Following a review of drinking water issues and federal options, the report concludes with seven recommendations for action by the federal government. The report strongly emphasizes the need for the federal government to cooperate with provincial and local governments in order to safeguard Canadian drinking waters.(au)

55 (069671)
MULLER, F.A. * ***The socioeconomic value of water in Canada*** * Mar 1985 * 104p * (Inquiry on Federal Water Policy research paper, no 5)

This study was intended to clarify the concept of the economic value of water and to estimate the value of water in the Canadian economy. Water use in Canada is highly concentrated in three non-manufacturing industries (agriculture, electric power and municipal waterworks) and in four manufacturing industries (chemical products, petroleum products, paper and allied products, and primary metal products). Total government expenditures on water-related activities were about 1% of Gross Domestic Product (GDP) in 1981. Total public and private construction expenditures related to water were about 2% of GDP. Of these, one half were related to construction of electric power generation and a further third to municipal water supply and wastewater treatment. The value of water can be measured by the willingness to pay for it. This depends heavily on the precise nature of alternatives and substitutes considered. Tentative estimates of average and total net willingness to pay for water in a number of uses were prepared based on available price and quantity data, estimates of the cost of alternatives, and on estimates of the elasticity of demand for water-based products. The total value of water in identified uses may range from $7.5 to $23.0 billion annually. These estimates must be interpreted with great caution. The use of water in its natural setting appears to have very high value for Canadians. The value of sports fishing uses is comparable to that of hydroelectricity generation and the value of non-fishing recreation and nonparticipatory benefits is likely to be of the same magnitude. Finally, the long-lasting and largely irreversible nature of water development projects suggests a conservative stance in assessing them.(au)

56 **(069672)**
DAY, J.C. * ***Canadian interbasin diversions*** * Mar 1985 * vii, 111p * (Inquiry on Federal Water Policy research paper, no 6)

Canadians have long experience in interbasin water transfer on which to base judgements concerning the desirability and management of future projects. Enormous progress was made in planning hydroelectric diversions over the past four decades. From an initial emphasis on engineering, geotechnical, and economic concerns in the Ogoki, Long Lake, and the first phase of the Kemano projects, gradually biophysical and social questions received increased attention and more sensitive treatment in the Churchill-Nelson, James Bay, and Kemano completion projects. But more effective institutional arrangements are needed to reconcile federal and provincial management responsibilities, particularly in the interjurisdictional setting of shared river basins. Before initiating any large-scale diversions of Arctic waters, studies are needed to define potential effects on climate and marine environments. The potential for detrimental change due to biota transfer when major drainage divides are crossed, also requires investigation. Enormous overbuilding of diversion-related hydroelectric capacity has been costly to the Canadian public. More equitable treatment of native groups negatively affected by diversions is a major need in future projects. The long-standing Canadian federal policy, which has consistently opposed water export without supporting evidence, needs to be rethought.(au)

57 **(069673)**
SCOTT, A. * ***The economics of water export policy*** * Mar 1985 * 104p * (Inquiry on Federal Water Policy research paper, no 7)

Economic aspects of the water export issue are addressed, as are means for economic analysis to contribute to Canadian policy on this subject. Federal and provincial governments are encouraged to prepare a policy which includes what bodies should be formed, what information should be collected and what procedures should be set out.(au)

58 **(069674)**
LEMARQUAND, D.G. * ***Boundary water relations and Great Lakes issues*** * Mar 1985 * 87p * (Inquiry on Federal Water Policy research paper, no 8)

The paper examines some of the main features of Canada-United States boundary water relations and some current Great Lakes problems. The intent is to provide a perspective on the problems and opportunities for responding to boundary water problems and for managing satisfactorily boundary water resources. The Boundary Waters Treaty of 1909 provides some basic principles that guide relations with regard to water use along the boundary. It also establishes the International Joint Commission (IJC). The principles and the Commission have proven invaluable in establishing the principle of equality in the use of boundary resources and in joint problem-solving approaches. In practice, the equality principle works well in the conduct of IJC activities and for issues where there is a reciprocal interest between Canada and the United States to reach agreement. However, in the resolution of some of the most important boundary issues, for example, widespread Great Lakes water quality problems or acid rain, the United States sees little advantage to negotiating agreements with Canada ahead of domestic resolution of the issues. In other issues, such as unequal consumption of boundary waters, the United States tends to interpret the equality principle differently from Canada and dismiss Canadian objections to loss of water without compensation. The relative insensitivity of American political processes to the effects of American activities on Canada means a poor response in the United States to Canadian government initiatives on many of these important issues. When the United States does seek accommodation for issues like water quality, it tends to demand of Canada similar commitments to solving the problem as it requires of American interests. The stress on equitable commitment is at odds with Canadian concerns for equality and equal sharing of boundary resources. While the scope for Canadian initiatives in many issues dealing with the Great Lakes is limited, there are a number of measures that can be undertaken to ensure better reception of Canadian views in Washington. These include strengthening of the IJC, thinking innovatively

to define issues in a manner that creates a reciprocal interest in achieving bilateral agreement, encouraging transnational approaches to boundary issues, greater political commitment of national leaders to pursue environmental and boundary water objectives, integrated federal-provincial responses to boundary water problems, and increasing and expanding the research and scientific capabilities of the federal government agencies involved in boundary water issues.(au)

59 (069675)
DEPAPE, D. * ***Federal-provincial co-operation in water - an exploratory examination*** * Mar 1985 * 48p * (Inquiry on Federal Water Policy research paper, no 9)

This report has been prepared for the Inquiry on Federal Water Policy by InterGroup Consultants Ltd. It is one of several research studies being carried out by the Inquiry. The work was largely carried out between October and December of 1984. The study provides an exploratory examination of water-related federal-provincial cooperation in accordance with terms of reference provided by the Inquiry. Particular emphasis is placed on identifying and discussing alternative approaches to such cooperation in the future.(au)

60 (069676)
SCHWASS, R.D. * ***Public information and public participation in water resources policy*** * Mar 1985 * 64p * (Inquiry on Federal Water Policy research paper, no 10)

This paper includes a review of recent events and the results of a workshop discussion of public consultation issues with respect to federal water policy. Several suggestions are directed toward improvement of Environment Canada's public information and participation programs, and a National Water Commission is proposed. This Commission might, among other things, work with all levels of government to develop better public understanding of Canada's future issues and options.(au)

61 (069677)
GOSSAGE, P. * ***Water in Canadian history: an overview*** * Mar 1985 * 134p * (Inquiry on Federal Water Policy research paper, no 11)

This research paper treats the history of water, the use and development in Canada from earliest times until roughly 1960. The discussion is organized into seven sections. The first six sections correspond to specific historical periods, and attention is focused mainly on the increasingly complex relationship between human societies and their water environment in northern North America. A brief outline of some of the geological forces which shaped that environment is followed by sections treating the importance of water to native people, to Canada's earliest explorers and traders, to the first European settlers in the 17th and 18th centuries, to the expanding agricultural and industrial communities of the 19th century, and to the 20th century Canadian society. The final section shifts attention to the role of the federal government in the development and management of the water resource in the period from 1850 to about 1930.(au)

62 (069678)
RUEGGEBERG, H. * ***Northern water issues*** * Mar 1985 * 81p * (Inquiry on Federal Water Policy research paper, no 12)

This study reviews the main water use and management issues in the Yukon and Northwest Territories and proposes measures to improve federal water administration in this part of the country. The themes addressed are the legal and administrative context in the North, northern water uses, water planning and management, the possible impact of aboriginal rights on water management, the jurisdictional and interjurisdictional issues, and the water diversion and export issue as viewed from the North.(au)

63 (069679)
WASHBURN, O.V. * ***The Saint John River: deterioration and restoration*** * Apr 1985 * iii, 69p * (Inquiry on Federal Water Policy research paper, no 13)

The report traces developments in the Saint John River Basin from the end of World War II to the present. The impacts of industrialization and economic development on the water resource are considered along with the efforts of governments to restore a balance of water resource uses. Recommendations are made for the continuing role of federal and provincial governments in management of the water resources of the Saint John River Basin.(au)

64 (069680)
VONHOF, J.A. * ***Groundwater issues: an overview*** * Inquiry on Federal Water Policy * May 1985 * 98p * (Inquiry on Federal Water Policy research paper, no 14)

Ground water is a neglected resource in Canada. Although approximately 30% of the population depends on ground water, the diffuse distribution of users, primarily the rural population, has resulted in relatively little attention on groundwater development and protection by government agencies. Although it has long been recognized that surface water and ground water are components of an interactive system, the effects of surface water development on ground water flow systems is generally neglected, as is the effect of induced changes in groundwater systems on downstream users of the total water resource. The attention paid by the province to the protection of groundwater resources is a function of their relevance as a source of potable water. Because of the inevitable time delay between the introduction of a contaminant into a groundwater flow system and its re-entry into another part of the terrestrial environment, groundwater contamination is generally not regarded as a politically urgent problem. Groundwater contamination problems in various parts of the country are in many instances unique and determined by the industrial activity and resources base. It is not possible at this

time to accurately assess the extent and severity of groundwater contamination because there is no readily available data base. In order to protect groundwater resources and, indirectly, the quality of surface water resources for the future, it is suggested that the federal government assume a much more active role. The protection of this resource is in the national interest and should as such be defined in a federal policy. The protection strategy developed by the Environmental Protection Agency in the United States could serve as a model for policy planning by the Canadian government.(au)

65 (069681)
MACTAVISH, J.S. * ***The federal role in water management*** * Apr 1985 * iv, 205p * (Inquiry on Federal Water Policy research paper, no 15)

This review assesses major federal legislation policies and programs related to water resource management in Canada, exclusive of its provincial-type role in Yukon and the Northwest Territories. The constitutional setting is described, including its uncertainties, highlighting the need for federal-provincial cooperation. Ten federal laws relating to water are examined and recommendations presented to improve the Canada Water Act, Environmental Contaminants Act and the Fisheries Act. Major federal programs assessed include those related to water quantity and quality monitoring, planning, regulation, flood damage reduction, regional water development, Great Lakes water quality management, municipal facilities funding, toxic chemicals and airborne pollutants. Recommendations are presented to strengthen programs as appropriate.(au)

66 (069682)
MITCHELL, B.; MCBEAN, E. * ***Water resources research in Canada: issues and opportunities*** * Apr 1985 * v, 111p * (Inquiry on Federal Water Policy research paper, no 16)

This report focuses on three objectives: to provide an inventory of water research activities in Canada, to identify future research needs and priorities and to evaluate federal research programs regarding their capacity to respond to changing priorities for water resources research, coordination, and management in Canada. In addressing these objectives, the reported findings include evidence of approximately $55.8 million being spent on water resources research in Canada in 1983, with the federal government being the dominant participant, providing 73% of the funds and expending 51% of the funds. This funding level represents an effective 25% decrease since 1979. Extensive discussion is presented on the current structure and organization of water resources research efforts in Canada, on problems identified during the information collection efforts in Canada, and on recommendations made on possible approaches to improve the situation.(au)

67 (069683)
TATE, D.M. * ***Alternative futures of Canadian water use 1981-2011*** * May 1985 * ix, 105p * (Inquiry on Federal Water Policy research paper, no 17)

Projections of withdrawal water use in Canada, its five major regions and 47 major river basins are contained in this research report. The time period covered by the forecasts carried out here is 1981-2011. The methodology used is based upon structural modelling, employing a thirty-sector regional input-output model augmented for use in a water demand projection mode. Major variables used in the forecasting were economic activity levels, production technology and water use practices, as defined in the first chapter. The effects of a concerted effort at promoting water conservation were also modelled. An alternative approach to the forecasting problem is outlined in chapter 5, using the Red Deer River Basin as a hypothetical case study. The advantages of this simulation modelling approach relate to the integration into the water use forecasting process of water supply considerations and the ability to conduct studies on a river basin and sub-basin level as opposed to an economic region level. Six recommendations for further work are made in the final chapter.(au)

68 (069684)
TATE, D.M. * ***Alternative futures of Canadian water use 1981-2011 : Appendix a*** * May 1985 * 278p * (Inquiry on Federal Water Policy research paper, no 17)

This appendix presents numerical data in tabular form relating to five scenarios for future water use discussed in the main report. Data are given for all Canada and then broken down by region. The summary tables are divided by agricultural, mineral extraction, manufacturing, power generation, and municipal sectors. Each of these is in turn divided in three parts: water intake, gross water use, and consumptive water use.

69 (069685)
BOWDEN, G.; ANDERSON, M. * ***Water and Canadian agriculture : selected issues*** * Apr 1985 * 51p * (Inquiry on Federal Water Policy research paper, no 18)

This paper reviews selected issues in water use in Canadian agriculture. Agriculture is a major consumptive user of water in Canada, and as production grows, water consumption may increase significantly - particularly for irrigated agriculture in the Prairie provinces. Associated with the expansion of agriculture across Canada are concerns about resource degradation, soil erosion and salinity, flow depletion, water quality deterioration, and adverse impacts from drainage. Implicit in the recognition of these concerns is that water is no longer freely available for use in agriculture. This requires in turn a rethinking of past approaches where governments have been almost universally willing to underwrite the majority of costs associated with

supplying water for agriculture. Recognizing that using water in agriculture may impose costs elsewhere in the economy does not necessarily mean that use in agriculture should be curtailed, however. There needs to be consideration of whether the gains from use in agriculture exceed the costs imposed elsewhere. As far as federal participation is concerned, it is not clear that this question is being consistently asked. It should be, and the report recommends application of the federal benefit-cost guidelines to projects in which there is federal participation. It is also recommended that consistent standards and procedures for federal participation in water resources development in Canada be established.(au)

70 (069686)
MILLER, C.T. * ***Risk management workshop, February 1985*** * June 1985 * iv, 21p * (Inquiry on Federal Water Policy research paper, no 19)

This paper includes a brief overview of the nature of risk management as well as results of a workshop on the subject held in February 1985. Suggestions are made in order to better define the structure of decision processes, the risk policies and the federal/provincial roles in risk management and to improve the legitimacy of risk management decisions.(au)

71 (069687)
ROBINSON, J.E.; ANDERSON, M. * ***The role of water demand management in a federal water policy*** * June 1985 * vii, 87p * (Inquiry on Federal Water Policy research paper, no 20)

This paper presents an overview of water demand management, its importance, and how it should be integrated with supply management for water and wastewater systems. Demand management measures in agriculture include dryland cultural practices, improved water delivery systems (both off-farm and on-farm), water scheduling, and water metering; each of these could provide productivity gains of 15 to 25%, allowing a doubling of irrigated production with existing supplies. In the industrial sector, recycling processes can reduce water use per unit of output by up to 97% for individual firms, and perhaps up to 75% in industries such as pulp and paper. Municipal water use can be reduced by 13 to 50% for each of the following: improving distribution system maintenance, metering, rate structure modification, and use of insulated and heat-traced services in northern communities. Long-term reduction of over 25% can be achieved in new residential development by ensuring new structures include more water-efficient fixtures and appliances. Despite institutional problems, the federal government can assist through improved coordination among departments, refocusing supply-oriented technical assistance, additional research and extension education, support for public information services including interest groups, tax incentives, programs and actions to facilitate use of more water-efficient fixtures, and support of provincial initiatives related to demand management.(au)

72 (069688)
HANKE, S.H.; FORTIN, M. * ***The economics of municipal water supply: applying the user-pay principle*** * June 1985 * vp * (Inquiry on Federal Water Policy research paper, no 21)

This report consists of two papers on the user-pay principle, which requires that users pay the full economic costs of the goods and services that they consume. Equity, efficiency and conservation would be promoted by the application of this principle to municipal water use. The first paper reviews municipal water rates and rate-setting practices in Canada. Since this sector is almost entirely public in ownership, the extent to which user-pay principles prevail will be a matter of government policy and institutional practice. The second paper reviews economic concepts and tools and applies them to urban water supply problems in other countries.(au)

73 (069689)
HATFIELD, C.T.; SMITH, G. * ***Instream resource values and protection needs in Canada*** * July 1985 * vp * (Inquiry on Federal Water Policy research paper, no 22)

Instream water resource uses are defined as the uses of water in place in lake, stream and estuary systems, as compared to offstream uses, taken out of the natural system. Instream uses include the environmental uses of providing habitat for fish and water-associated birds and mammals, as well as human uses that range from recreation and aesthetics enjoyment to pollution control and transportation. Conflicts are occurring over the use of water resources for different needs. Typically, the geographic scope of conflicts is confined within specific stream basins, but interbasin conflicts are also becoming common. A major difficulty in addressing and settling conflicts is the determination of the value of the different uses. The valuation of instream water uses is rarely directly documented; rather, values are generally expressed in terms of the expenditures involved in making use of the water. The value of instream water quantity, therefore, has not been as adequately studied as has the value of water quality. Because of the scientifically documented and publicly accepted importance of water quality, large amounts of regulatory agency time and money have been allocated to controlling instream water quality. Instream water quantity control, however, has received much less attention. The only water quantity documentation being done by the federal government, for example, is the water survey records compiled by Environment Canada, Inland Waters Directorate. The lack of federal responsibility in instream water quantity control work likely has contributed to the geographically disjointed development of methodologies to quantify instream use value as a function of stream discharge. It is recommended that most federal agencies presently involved in various aspects of instream water resource assessment and allocation relinquish their responsibilities in favour of the establishment of one agency which would be responsible for developing and administering

regional, local and hierarchical strategies for applying specific instream flow assessment methodologies to specific situations.(au)

4.3 Hearings / Audiences

4.3.1 St. John's

74 (073537)
Inquiry on Federal Water Policy : St. John's, Newfoundland, September 24, 1984 * 1984 * 98p

Four submissions were presented at the public hearings held in St John's, Newfoundland. A submission by the Atlantic Region of Environment Canada highlighted problems of water quality, water scarcity, and flooding. The need for more water data was emphasized as well as more analyses and interpretations of water data. The brief also emphasized the need for all levels of government to evaluate the impact of their operations and programs on water resources. The need for increased funding for research was also noted and it was suggested that consideration be given to instituting pricing policies. A brief by J. Barnes outlined the role that the Inquiry could play in recommending development of a strategy for the management of peatlands as a water resource while a brief by Dr. J. Gale of Memorial University highlighted areas of concern relating to ground water including the need for a sound data base and the need for more integrated research. In a brief presented on behalf of the GRAND Canal Company Limited, the Great Recycling and Northern Development Canal Concept was described. The concept involves a proposal to transfer water from James Bay to the Great Lakes.

4.3.2 Halifax

75 (073535)
Inquiry on Federal Water Policy : Halifax, Nova Scotia, September 18 & 19, 1984 * 1984 * 128p

Eight submissions were presented at the public hearings held in Halifax, NS. A brief presented on behalf of the Nova Scotia Department of the Environment advocated an effective and efficient water management scheme involving cooperative efforts by senior levels of government. It also recommended an increased emphasis on the economic and social dimensions of water resources in the development of water management policies. A brief by the Nova Scotia Health Department addressed water quality and water quantity concerns from a public health perspective and included recommendations regarding water treatment. Issues and concerns presented in other briefs included the need for research on health effects of contaminated water, effects of river runoff, flooding, shoreline erosion, irrigation, agricultural drainage, acid rain, drinking water standards, and protection of water supply.

4.3.3 Charlottetown

76 (073538)
Inquiry on Federal Water Policy : Charlottetown, P.E.I., September 26, 1984 * 1984 * 50p

Two briefs were presented at the hearing held in Charlottetown, PEI. A submission on behalf of the Prince Edward Island Ministry of Community and Cultural Affairs touched upon areas of provincial jurisdiction and highlighted provincial involvement in water resource management. Federal-provincial projects that have been successful in dealing with water resource problems were noted as well as future proposals that may affect water resource management. Concerns relating to ground water, agriculture, fisheries, molluscan aquaculture, drinking water quality and the importance of federal-provincial cooperation in dealing with water resources were stressed. A submission on behalf of the Morell and Area Land Use Steering Committee expressed concern regarding problems associated with erosion and siltation, the effects of highway development on the river, the multiple use of rivers, and the need to educate the public about these problems.

4.3.4 Fredericton

77 (073536)
Inquiry on Federal Water Policy : Fredericton, New Brunswick, September 20, 1984 * 1984 * 79p

Five submissions were presented at the public hearings held in Fredericton, NB. A brief on behalf of the New Brunswick Ministry of the Environment stressed the importance of federal funding for municipal water, sewer and sewage treatment facilities. It also emphasized the importance of integrating fish habitat management and water management policies and the importance of long-term cooperation in the administration of water resources. Indian representatives expressed concern about the quality of water, and about soil erosion. The Association of Professional Engineers focused upon computer utilization in the area of water management and suggested that federal water policy must include a commitment to infrastructure maintenance and development. Instrumentation development was considered a key issue as was water research in general. Recommendations made by the Saint John River Board, Hydrology Committee included mandating of the Inland Waters Directorate (IWD) to collect and archive snow pack data,

continuation by IWD of current snow surveys, and encouragement for development of new instrumentation and techniques for snowpack measurement. Concerns expressed by the city of Saint John related to acid rain, national drinking water standards, funding for sewage treatment facilities and increased support for research.

4.3.5 Montréal

78 (073547)
Inquiry on Federal Water Policy : Montreal, November 5 & 6, 1984 * 1984 * 176p

Eleven briefs were presented at the public hearings held in Montreal. Concerns were expressed by Cree Indians regarding the impact of major hydroelectric developments and, in particular, the effects of any changes to the water systems in Hudson Bay and James Bay. It was emphasized that the federal government had a responsibility to protect the life styles of the Indians. The problems of interprovincial and international jurisdiction were addressed, and it was recommended that Environment Canada be given a stronger mandate in order to deal effectively with water-related issues. Problems associated with sewage outfalls and combined storm and sanitary sewers were highlighted and some solutions to the problems were suggested. Other areas of concern included conflicting uses of water, water conservation, wastewater recycling and water rates.

4.3.6 Ottawa

79 (073551)
Inquiry on Federal Water Policy : Ottawa, Ontario, December 3-10, 1984 * 1984 * 3v (742p)

Thirty-nine briefs were presented at the public hearings held in Ottawa by representatives of environmental organizations, various government departments, water corporations and federations. The briefs related to drinking water quality, water transport, water pollution control, wetlands, river systems, freshwater springs, water research, water planning and management including northern concerns, wildlife resources and habitats, and interjurisdictional responsibilities and concerns.

4.3.7 Toronto

80 (073546)
Inquiry on Federal Water Policy : Toronto, Ontario, October 31st to November 2, 1984 * 1984 * 2v (497p)

Twenty-seven briefs were presented at the public hearings held in Toronto by representatives of federal, provincial and municipal governments, interested individuals as well as environmental and wildlife organizations. The briefs focused on concerns relating to water quality, water quantity, conflicting uses of water, the need for demand management strategies, and for multi-jurisdictional cooperative management. Concerns regarding groundwater contamination, means of preserving wetlands, inequities resulting from diversions and the importance of controlling water pollution were highlighted. Recommendations were made in terms of existing laws, new directions for groundwater strategy and safe drinking water legislation. Concerns of Indians relating to diversion of water to or from the Great Lakes were expressed as well as their concerns about major hydro impoundments that relate to rivers flowing through Ontario to James Bay. The importance of the federal role in ensuring a long-term perspective on water resource issues was stressed and an overview was given of acid rain research in Canada. Consideration was also given to whether or not adequate cooperative arrangements exist to effect solutions to the acid rain problem.

4.3.8 Winnipeg

81 (073545)
Inquiry on Federal Water Policy : Winnipeg, Manitoba, October 24, 1984 * 1984 * 225p

Fifteen submissions presented at the public hearings held in Winnipeg expressed concerns by individuals, environmental organizations and governments on water quality issues, water supply, the need for environmental monitoring, flood control and protection, pricing, public education, the watershed approach to water management and the growing importance of recreation and tourism. Suggestions were also put forward for improved water programs and for land use policies.

4.3.9 Regina

82 (073543)
Inquiry on Federal Water Policy : Regina, October 22, 1984 * 1984 * 160p

Seven submissions were presented at the public hearings held in Regina, Saskatchewan. A submission by the Association of Consulting Engineers of Saskatchewan emphasized the importance of cooperation between the federal and provincial governments with regard to water resources and the need for public education about the water issue. The problems of water availability and water distribution in the Prairies were addressed in a brief by the Inland Waters Directorate and both short- and long-term strategies for water

management were proposed. The Cumberland House Band documented impacts that development of the Saskatchewan River has had on its people. A brief on behalf of the Saskatchewan Wildlife Federation highlighted problems being experienced in Saskatchewan associated with water drainage, the Grain Quota Marketing System, and inadequate funding for the Waterfowl Crop Degradation Program. The need to establish a national program to secure, preserve and manage prairie wetlands was emphasized. The presentation of the Prairie Farm Rehabilitation Administration emphasized the need for a federal water policy that would take into account the wide variety of users in the prairies agriculture with regard to both quality and quantity of water supplies. A brief by the Saskatchewan Urban Municipalities Association focused on the problems of small communities, while the Conservation and Development Association concentrated on concerns associated with flooding and flood control.

4.3.10 Saskatoon

83 (073544)
Inquiry on Federal Water Policy : Saskatoon, Saskatchewan, October 23, 1984 * 1984 * 98p

Four submissions were presented at the public hearings held in Saskatoon. A submission by the Canadian Organic Producers Marketing Co-operative Limited related health costs to environmental pollution, advocated banning the use of agricultural chemicals and recommended more research on the relationships between ground water and surface water. The Fond du Lac Indian Band expressed concerns in its submission regarding the impact of future developments in the Lake Athabasca watershed and requested that it be part of any planning of resource development in the area. A submission by Professor C.M. Williams addressed water issues in Saskatchewan from an agricultural perspective emphasizing water demand and supply, use of herbicides, irrigation, and aquifers. A brief presented on behalf of the Saskatachewan Well Water Association expressed concern about the level of government funding for research on aquifers and the need for federal management policy to coordinate local organizations and governments to control pollution and contamination of ground water.

4.3.11 Calgary

84 (073539)
Inquiry on Federal Water Policy : Calgary, Alberta, October 9 & 10, 1984 * 1984 * 230p

Fifteen briefs presented at the public hearings held in Calgary addressed municipal concerns, funding, the need for a national research body for aquatic resources, cooperation amongst jurisdictions in the formation of water management policies, the concerns of Indians regarding jurisdiction over water, the need for a conservation strategy, the importance of public awareness of water management issues, the training and competence of plant operators, the use of effluent irrigation, the management of renewable resources, the importance of a water quality data base, the enhancement of weather forecasting capabilities, and the need to understand chemical, biological and physical processes that serve to affect the aquatic environment.

4.3.12 Edmonton

85 (073540)
Inquiry on Federal Water Policy : Edmonton, Alberta, October 12, 1984 * 1984 * 100p

Five briefs were presented at the public hearings held in Edmonton. Two briefs were presented by the Environmental Law Centre. The first dealt with the enforcement of environmental law, specifically, the Fisheries Act. The brief outlines three major areas of concern with the enforcement of the Act in Alberta: conflicting authority; the system of monitoring and surveillance; and administrative diligence. The second brief addressed interjurisdictional water management issues related to the proposed Slave River hydroelectric dam. A submission by the Environmental Resource Centre dealt with questions of river basin and water transfer as well as Indian water rights. A submission by Dr. W.C. Mackay and Dr. E.E. Prepas pointed out that the quality the water on the western boreal plains is unique and deserves federal recognition in setting out research priorities when applied aquatic research is planned and funded. A submission by R. MacIntosh outlines criteria that the federal water policy should meet and set out several recommendations regarding water management including the formation of a Watershed Management Board based on watershed areas involving federal, provincial and municipal governments, a federal office of water conservation, and an amendment of the National Building and Plumbing Codes and Guidelines to require water saving features in all new construction. Recommendations were also made in relation to water quality, protection of rivers, interbasin transfer of water and research and development into pollution control technology.(au)

4.3.13 Kelowna

86 (073550)
Inquiry on Federal Water Policy : Kelowna, British Columbia, November 28, 1984 * 1984 * 154p

Twelve briefs were presented at the public hearings held in Kelowna, BC. The Okanagan Basin Water

Board outlined problems associated with wastewater treatment, urban runoff, and aquatic weed control. A submission by the Corporation of the District of Peachland recommended enforceable standards for substances that adversely affect health and expressed concern regarding the level of cooperation between federal and provincial governments. Other concerns raised during the hearings related to the need for an expanded Canada Water Act, better monitoring of water resources, the need for more research, and in particular, for a water-related laboratory facility in the Okanagan, the issue of safe drinking water, the recreational use of water, the use of herbicides in treating milfoil, and the pollution of water by mine wastes.

4.3.14 Vancouver

87 (073548)
Inquiry on Federal Water Policy : Vancouver, B.C., November 19-23, 1984 * 1984 * 3v (596p)

Twenty-eight briefs were presented at the public hearings in Vancouver, BC, by representatives of environmental organizations, various levels of government, native people and interested individuals expressing concern about a wide variety of water-related issues including water export, the impact of hydroelectric development on wildlife and fish, the effects of mine wastes on water quality, and the enforcement of regulations. Relationships between water, water quality, development of water policy and aboriginal people were emphasized in submissions by several Indian tribes. River protection and recreation were seen as emerging water issues and the need for greater federal-provincial cooperation in dealing with water issues was noted. Other areas of concern identified at the hearings included the need for special management of estuaries, interbasin transfers, eutrophication, bilateral water management, the need for greater public awareness of water issues, and the need to establish research priorities.

4.3.15 Victoria

88 (073549)
Inquiry on Federal Water Policy : Victoria, British Columbia, November 26, 1984 * 1984 * 166p

Seven briefs were presented at the public hearings held in Victoria, BC. A brief by the Islands Trust, Victoria, highlighted concerns regarding water quantity and water quality on the island with the emphasis on problems associated with sewage disposal. The brief also addressed water issues associated with the marine environment, including the intensification of conflicts amongst users and sewage pollution in many coves and bays of the Strait of Georgia. A brief by C.G. Keenan expressed strong objection to the inquiry on the grounds that water resource management comes under the jurisdiction of the provinces not the federal government. A submission by the Society Promoting Environmental Conservation highlighted the concerns regarding the Fraser River Estuary Study. Problems associated with cost of irrigation water were expressed in the brief presented by the Saanich Peninsula Farmers Institute. In its submission, the Association of Professional Biologists of BC focused upon the preservation and well-being of freshwater aquatic habitats for fish and wildlife as well as the development of water management policies and practices. A brief by C.H. Templeton outlined a regional planning approach to water management and recommended the establishment of a national water commission. Briefs by the Sierra Club of Western Canada stressed the need for federal legislation and regulations to safeguard water resources.

4.3.16 Yellowknife

89 (073542)
Inquiry on Federal Water Policy : Yellowknife, N.W.T., October 16, 1984 * 1984 * 139p

Seven briefs were presented at the public hearings held in Yellowknife, Northwest Territories. A major concern expressed in the brief of the Government of the Northwest Territories was the interjurisdictional nature of problems associated with water resources development. A phased transfer of authority to the North was recommended as well as a clarification of the federal role. The Northwest Territories Chamber of Mines outlined several recommendations that would enable mines to operate more efficiently while maintaining an acceptable level of water quality. Representatives of the Dene nation emphasized the importance of water quality to their people and the need for more comprehensive resource planning. A submission by the Slave River Basin Coalition addressed concerns related to transboundary water management issues and raised the issue of native rights to water. The Slave River Development Impact Zone Society outlined concerns related to the proposed Slave River hydro project. The group emphasized the need for a transfer of authority, for increased public participation, and for licensing for non-consumptive water use. A brief presented by the Department of Indian and Northern Affairs identified seven major northern water issues, five of which relate to planning and management of the resource. Finally, a submission by the Northwest Territories Water Board describes the Board and outlines its current activities.

4.3.17 Whitehorse

90 (073541)
Inquiry on Federal Water Policy : Whitehorse, Yukon, October 15, 1984 * 1984 * 86p

Five briefs were presented at the public hearings in Whitehorse. The submission of the Yukon Region of the Department of Indian and Northern Affairs focused on the competition between many different users for the existing water resource, the effects of major hydroelectric development, potential problems of large interbasin transfers of water and, finally, on the issue of interjurisdictional responsibility. The submission of Queenstake Resources Ltd. expressed concern about unrealistic water quality standards being imposed upon the placer mining industry in the Yukon. The company suggested that if the placer industry is to maintain its strong role in the Yukon economy, guidelines will have to be developed to recognize the needs of the industry and its reliance on water resources. The Yukon Conservation Society recommended that federal water policy must respect the uniqueness and fragility of northern aquatic systems, and that interbasin transfers should not be allowed. Recommendations were also made regarding the long-term abandonment of industrial wastes and the establishment of a mechanism for resolution of transboundary waters problems. A submission by the Yukon Association of Wilderness Guides stressed the need to take into account anticipated growth in the wilderness/adventure travel industry in any future plans for Yukon waterways. In its submission, the Northern Canada Power Commission emphasized the need to recognize the enormous potential for hydro power development when formulating future water policy.

4.4 Briefs presented at the hearings (with transcripts) / Mémoires présentés lors des audiences (avec transcriptions)

91 (F13128)
AFFAIRES INDIENNES ET DU NORD CANADA * ***Présentation soumise à la Commission d'enquête sur la politique fédérale relative aux eaux*** = Submission paper to the Inquiry on Federal Water Policy * In: Transcript of hearings : Inquiry on Federal Water Policy, Ottawa, Ontario, December 3-10, 1984 * 1984? * 32p

Ce document est divisé en deux parties principales. La première traite de la question des eaux en relation avec les populations indienne et inuit, tandis que la seconde partie aborde la question des eaux dans le Nord. En ce qui concerne les populations autochtones, le document met en évidence le souci de ces populations envers la conservation de l'environnement, ainsi que les problèmes provenant des titres des populations sur les terres et non sur les eaux de leurs territoires. Leurs revendications sont mentionnées, et la gestion des eaux par les Indiens et les Inuit est détaillée. Les problèmes de gestion des eaux au nord du 60e parallèle sont expliqués dans la seconde partie, et les fondements législatifs y sont mis en évidence. Enfin, une politique fédérale relative aux eaux est définie, et l'auteur termine par des recommandations.

92 (073331)
AGRICULTURE CANADA * ***Emerging water issues and their impact on Canada's agriculture*** * In: Inquiry on Federal Water Policy : Ottawa, Ontario, December 3-10, 1984 * Dec 1984 * vp

Water quantity, water quality, federal-provincial jurisdiction, and allocation decision-making are the four principal water issues which Agriculture Canada sees as critical. How these issues impact upon the agricultural sector, a proposed framework for resolving these issues and the Department's role within this framework are described. This brief emphasizes that any federal water strategy must be part of an evolvement from an integrated, multigovernmental, national system designed to make effective decisions about water resources in the national and provincial interest. Agriculture Canada regards surveys and monitoring, basic and applied research, development programs, and regulation and registration of pesticides as the areas to which it has the responsibility and authority to contribute. The corresponding transcript of the hearings in Ottawa with questions and answers on specific aspects of the submission is attached.

93 (073497)
ALBERTA FISH & GAME ASSOCIATION * ***Presentation to: the Inquiry on Federal Water Policy by the Alberta Fish & Game Association*** * In: Inquiry on Federal Water Policy : Calgary, Alberta, October 9 & 10, 1984 * Oct 1984 * vp

Five recommendations are presented to support and promote water and land conservation practices that would retain the quality of life and sustain fish and wildlife in Alberta. These are developments of a conservation strategy for Canada and each province; federal-provincial agreement on water export and interbasin transfer; water pricing for conservation; water quality and river flow manipulation for electric power demand; and retention of the Federal Fisheries Act and the Heritage Rivers Plan. A corresponding transcript of hearings in Calgary addressing this submission is attached. Areas explored are priority uses of water and the user-pay concept.

94 (073499)
ALBERTA WILDERNESS ASSOCIATION * ***Water management problems in western Canada*** * In: Inquiry on Federal Water Policy : Calgary, Alberta, October 9 & 10, 1984 * Oct 1984 * vp

This submission states that water management in Canada especially in Alberta is often carried out with only token regard for the ecological consequences of these actions. This leads to reliance on simple

engineering solutions to complex social and environmental problems. Examples from Alberta in the areas of assimilative capacity, interbasin water transfer and water allocation are presented. Sound water management must recognize that water is a unique resource and that aquatic ecosystems are vital. Although water is a provincial jurisdiction, the federal government can and should play a larger role in its management. Federal and interprovincial cooperation is essential to good management. Eleven recommendations are presented including a user-pay strategy, prohibition of selling water outside the country, and the need for research on all aspects of aquatic ecology and water management. A corresponding transcript of hearings in Calgary addressing this submission is attached.

95 (073573)
AMERICAN WATER WORKS ASSOCIATION, ONTARIO SECTION * ***Inquiry on Federal Water Policy : a brief prepared by the Ontario Section, American Water Works Association*** * In: Inquiry on Federal Water Policy : Toronto, Ontario, October 31st to November 2, 1984 * Sept 1984 * vp

The recommendations and reports contained in this detailed brief accentuate those aspects of water policy in Canada that reflect on drinking water as a finished product. Chapters are included on aspects of existing federal water policy and organizational issues; conflicting uses; international uses; water quality; the federal role in water management; the Safe Drinking Water Act; toxic chemicals, acid rain and research; quantity and quality issues; economics of water supply management; and the Federation of Associations on the Canadian Environment (FACE). Detailed recommendations are also presented in these areas. A corresponding transcript of hearings in Toronto addressing this submission is attached. Many of the recommendations are explored including the federal role in water management, water pricing and subsidies, public participation and Great Lakes management, municipal water quality standards, funding for FACE, water quantity versus water quality, demand management, and water transfer and diversion.

96 (073314)
ASSOCIATE COMMITTEE ON HYDROLOGY OF THE NATIONAL RESEARCH COUNCIL OF CANADA * ***A submission to the Inquiry on Federal Water Policy by the Associate Committee on Hydrology of the National Research Council of Canada*** * In: Inquiry on Federal Water Policy : Ottawa, Ontario, December 3-10, 1984 * 1984? * vp

This brief focuses on the conduct of water research in Canada. It stresses the need for integration of the research effort and recommends mechanisms for promoting integration. Seven recommendations are proposed to ensure that the research effort is integrated to minimize unnecessary duplication so that research institutions can effectively respond to the needs of water users and managers. Exchange of information, links with users and managers, and coordinated supervision particularly need attention. A Water Resources Research Board to overview the entire research effort in the water sector on an ongoing basis is one of the main recommendations. The background and main functions of the Associate Committee on Hydrology are outlined. The corresponding transcript of the hearings in Ottawa addressing this submission is attached.

97 (073384)
ASSOCIATION OF BRITISH COLUMBIA GRAPE GROWERS * ***Submission of the Association of British Columbia Grape Growers to the Inquiry on Federal Water Policy*** * In: Inquiry on Federal Water Policy : Kelowna, British Columbia, November 28, 1984 * 1984? * vp

This brief submission presents the opposition of British Columbia grape growers to the use of 2,4-D in the lakes and adjoining rivers of the Okanagan and Similkameen valleys. Approximately 60% of the total area in the province planted to grapes is irrigated from these lakes and rivers. The herbicide is lethal to grapes and the entire grape and wine industry. It is suggested that prior to any treatment with 2,4-D, an experiment designed to determine the grapevine's susceptibility to injury from 2,4-D treated water should be undertaken. This submission forms part of the corresponding transcript of hearings in Kelowna.

98 (073380)
ASSOCIATION OF BRITISH COLUMBIA PROFESSIONAL FORESTERS * ***Submission to the Inquiry on Federal Water Policy by the Association of British Columbia Professional Foresters*** * In: Inquiry on Federal Water Policy : Kelowna, British Columbia, November 28, 1984 * Nov 1984 * vp

The Association of British Columbia Professional Foresters is concerned that policies and regulations considered by the Inquiry on Federal Water Policy recognize the interdependent nature of resources in the ecosystem and promote wise use of all forest land resources. Policies which regulate the management of forested watersheds influence water quantity and quality, and water policy can also result in a loss of productive forest land. The Association realizes the responsibility foresters have in water resource management. A corresponding transcript of hearings in Kelowna addressing this submission is attached. Areas explored are the effects of clear-cutting on watersheds, effect of forestry practices on water quality in the Okanagan Lake and reforestation responsibilities.

99 (073412)
ASSOCIATION OF CONSULTING ENGINEERS OF SASKATCHEWAN * ***Association of Consulting Engineers of Saskatchewan brief to the Inquiry on Federal Water Policy*** * In: Inquiry on Federal Water Policy : Regina, Saskatchewan, October 22, 1984 * Sept 1984 * vp

Several recommendations are put forward to ensure that Saskatchewan's resources are effectively and practically developed, utilized, protected and conserved.

These include resolution of jurisdictional differences so that water users have a clear awareness of government requirements and policies to protect the resource and maximize the benefits; baseline hydrological information and programs be maintained by the federal government; provision for enhancing public participation, awareness and education to ensure better understanding and appreciation of this resource; and improved interaction between the private sector and government to optimize technology development and transfer. A corresponding transcript of hearings in Regina addressing this submission is attached.

100 **(073389)**
ASSOCIATION OF PROFESSIONAL BIOLOGISTS OF BRITISH COLUMBIA * ***A brief to the Inquiry on Federal Water Policy : submitted by the Association of Professional Biologists of British Columbia*** * In: Inquiry on Federal Water Policy : Victoria, British Columbia, November 26, 1984 * 1984? * vp

The main focus of this submission is on the preservation and well-being of freshwater aquatic habitat for fish and wildlife in British Columbia. Legislation bearing upon water management and aquatic habitat is examined. A particular concern is the fragmented nature of water management in British Columbia and the lack of any unifying and consistent approach to dealing with its many facets. The need for an overall planning process with authority to resolve interagency conflicts and to develop integrated management programs is recommended. Important water resource issues to consider in such a plan include instream flow requirements, water export, hydroelectric development, non-point sources of pollutants, flood plain settlement, herbicide use and steep slope logging. A corresponding transcript of hearings in Victoria addressing this submission is attached.

101 **(073423)**
ASSOCIATION OF PROFESSIONAL ENGINEERS OF THE PROVINCE OF NEW BRUNSWICK * ***Submission to the Inquiry on Federal Water Policy by the Association of Professional Engineers of the Province of New Brunswick*** * In: Inquiry on Federal Water Policy : Fredericton, New Brunswick, September 20, 1984 * Sept 1984 * vp

This submission recommends that the components on a federal water policy must include a commitment to infrastructure (water distribution and wastewater collection) maintenance and development; reflection of the impact of high technology on water management including the establishment of a centralized national agency for the coordination of water-related computer software distribution and development; hydrometric data collections; required information and technology and increased research and development to deal with water resource problems; and more projects to support the consulting engineering industry. A corresponding transcript of the hearings in Fredericton addressing this submission is attached. Areas explored are the need for rehabilitation and modernization of the waterworks and sewage works industries and the need for increased water research.

102 **(F13131)**
ASSOCIATION QUÉBÉCOISE DE L'INDUSTRIE DU NAUTISME INC. * ***Mémoire à être présenté dans le cadre de l'Enquête sur la politique fédérale des eaux (sic)*** * In: Transcript of hearings : Inquiry on Federal Water Policy, Montréal, Québec, November 5 & 6, 1984 * 1984? * pd

Ce document présente le point de vue et les préoccupations de l'Association québécoise de l'industrie du nautisme. Un bref historique de l'Association est d'abord présenté, ensuite ses buts et objectifs sont énumérés. Les thèmes mis en évidence sont la circulation libre sur les eaux québécoises (avec des embarcations motorisées), la modification des lois afin que l'eau devienne un territoire public et la pollution des eaux douces par rapport à la navigation de plaisance (l'Association est convaincue que les bateaux à moteur ne polluent pas, mais le gouvernement ne partage pas cette opinion). Ces trois points sont repris dans une brève conclusion.

103 **(F13129)**
ASSOCIATION QUÉBÉCOISE DES TECHNIQUES DE L'EAU * ***Mémoire de l'Association québécoise des techniques de l'eau présenté au Comité d'enquête sur la politique fédérale relative aux eaux*** - Version révisée * In: Transcript of hearings : Inquiry on Federal Water Policy, Montréal, Québec, November 5 & 6, 1984 * 05 nov 1984 * 9p

Ce document synthétise les préoccupations de l'AQTE (Association québécoise des techniques de l'eau) vis-à-vis de la ressource eau. Tout d'abord, la fonction et les objectifs de l'AQTE sont définis, ensuite la question de l'eau est abordée sous les thèmes d'assainissement des eaux, de qualité et de gestion des eaux, ainsi que d'une politique fédérale à définir. Le rôle fondamental du gouvernement fédéral dans la politique de l'eau est mis en évidence et enfin, les souhaits de l'AQTE sont présentés.

104 **(073532)**
ATHABASCA CHIPEWYAN INDIAN BAND * ***Brief to the Inquiry on Federal Water Policy presented by Martha Kostuch*** * In: Inquiry on Federal Water Policy : Edmonton, Alberta, October 12, 1984 * Oct 1984 * vp

Seventeen recommendations are presented on water concerns in Alberta including water quality issues such as enforcement of environmental legislation, acid rain, and controls on vehicle emissions and water quantity issues including water use fees, public awareness about water conservation, water demand reduction, interbasin transfer, environmental impact assessment of the Oldman Dam, Canadian Heritage Rivers System, government responsibilities for environment conservation and a more clearly defined role of the Environment Council of Alberta. A corresponding transcript of hearings in Edmonton addressing this submission is

attached. Areas explored are essential elements of a federal water policy and the role of the federal government in regulating water management in Alberta.

105 (073433)
ATLANTIC CANADA SECTION, AMERICAN WATER WORKS ASSOCIATION * ***Submission from the Atlantic Canada Section, American Water Works Association to the Inquiry on Federal Water Policy*** * In: Inquiry on Federal Water Policy : Halifax, Nova Scotia, September 18 and 19, 1984 * Aug 1984 * vp

Current concerns in Atlantic Canada on various aspects of potable water supply treatment and distribution are detailed. These are acid rain impact on water supplies by contributing to the pickup of heavy metals in the piping system; a national drinking water standard must not be unilaterally adopted without consultation with all concerned parties and consideration for cost benefits complying with proposed standards; more research is needed to determine medical implications of potable water contaminants and how to remove them cost effectively; a nationwide standard of training and certification of personnel in the waterworks industry; and water quality should be the first priority on any water supply watershed and multiple uses of the resources must be carefully considered. A corresponding transcript of hearings in Halifax addressing this submission is attached.

106 (073427)
Background information on the Inquiry on Federal Water Policy * In: Inquiry on Federal Water Policy : Halifax, Nova Scotia, September 18 and 19, 1984 * 1984 * vp

This document provides background information on the Inquiry on Federal Water Policy. This includes sections on appointments to the Inquiry; membership of the Inquiry; terms of reference; participation paper Water is a Mainstream Issue (see Accession Number 068790); consultation with the provinces; arrangements with federal departments; research program; public hearings; report on hearings and assessment period; and final report. A brief corresponding transcript of hearings addressing this document is attached.

107 (073513)
BARNES, J.L. * ***The hydrology and water resources of peatlands in Canada*** * In: Inquiry on Federal Water Policy : St John's, Newfoundland, September 24, 1984 * Sept 1984 * vp

This personal submission presents a literature review of the hydrology and water resources of peatlands and demonstrates the lack of research in this field in Newfoundland and Canada. The role to be played by the Inquiry on Federal Water Policy in developing a strategy for the management of peatland as a water resource is outlined. This strategy should be based on the results of sound scientific investigations. Four specific recommendations to be carried out by the Department of Environment pertain to the nature and direction of future research required, improvement in the data collection network, active encouragement of research through federal funding, and liaison with other countries who are involved with similar research. A corresponding transcript of hearings in St John's addressing this submission is attached. Areas explored are the role played by peatlands in the water supplies of Newfoundland and ways to inventory this resource.

108 (073368)
BC PROVINCIAL EXECUTIVE OF THE COMMUNIST PARTY OF CANADA * ***Submission to the Inquiry on Federal Water Policy submitted by the B.C. Provincial Executive of the Communist Party of Canada*** * In: Inquiry on Federal Water Policy : Vancouver, British Columbia, November 19-23, 1984 * Nov 1984 * vp

This submission draws attention to water problems as they are developing in British Columbia. Areas examined include Canada's water supply, current water usage and increasing demand in Canada, extent and growing danger of pollution, inadequacy of present water pollution control policies, water transfer across Canada to serve Canadian needs, water export to the United States, federal/provincial conflicts and water management. Recommendations include federal/provincial legislation to strictly enforce pollution control on polluter-pay principle; no export of water to the United States; action to encourage more intensive use of water; no export of power to the United States; and action to direct Canadian water across Canada to areas where it is needed most. A corresponding transcript of hearings in Vancouver addressing this submission is attached.

109 (073345)
BC WILDLIFE FEDERATION * ***A submission to the Inquiry on Federal Water Policy presented by the B.C. Wildlife Federation*** * In: Inquiry on Federal Water Policy : Vancouver, British Columbia, November 19-23, 1984 * Nov 1984 * vp

The ethics of water management and the preemptive kinds of water management decisions likely to be the most permanently disruptive in the long term in British Columbia are addressed. This submission is divided into two parts. Part 1 explores the human impacts on water, current habitat problems, effects of major hydroelectric projects and resource losses, short-term employment and hydro development, power for export, dams and salmon, social/ecological impact of hydro development, water export and the provincial water budget. Part 2 discusses water quality and human ethics. A corresponding transcript of the hearings in Vancouver addressing this submission is attached. Areas explored are the role of a central clearinghouse for information on water values which the public could use and the need for more effective legislation and institutional structures to facilitate it.

110 (073312)
BIOLOGICAL SURVEY OF CANADA (TERRESTRIAL ARTHROPODS) * ***Requirement for research on freshwater springs*** * In: Inquiry on Federal Water Policy : Ottawa, Ontario, December 3-10, 1984 * 1984? * vp

This communication proposes that research be initiated on springs, a fundamental aspect of Canadian fresh waters. As part of an ongoing project on animal communities of special habitats in Canada, the Biological Survey of Canada is developing and coordinating a national project on springs. In developing the background data needed, the Survey has recognized that there is no good national inventory of these habitats. Information is needed on the exact location and basic physical and chemical characteristics of springs. The Biological Survey intends to survey springs across Canada to provide a tool for management of groundwater resources. The corresponding transcript of the hearings in Ottawa addressing this submission is attached. Emphasis is on the need to include springs and spring water habitats in government policy on freshwater habitats.

111 (073377)
BRENDA MINES LTD. * ***Brief submitted by Brenda Mines Ltd. to the Inquiry on Federal Water Policy*** * In: Inquiry on Federal Water Policy : Kelowna, British Columbia, November 28, 1984 * Nov 1984 * vp

This brief by Brenda Mines presents reasons for the discharge of supernatant from the tailings pond to Okanagan Lake by describing the original water permit conditions, history of the Peachland water supply, events leading up to the 1984 discharge, method of carrying out and monitoring the discharge, and modifications to the system. It is felt that if new standards are established, they must apply equally to all users. The company recommends that one central body be charged with the responsibility and authority to set standards and deal with all matters pertaining to the Okanagan area. This would provide the fairest and most effective means of restoration and enabling the lake to achieve its potential. A corresponding transcript of hearings in Kelowna addressing this submission is attached. Areas explored are properly informing the public, water recycling at Brenda Mines and the impact of mine shutdown.

112 (073347)
BRITISH COLUMBIA WATER WELL DRILLING ASSOCIATION * ***Brief submitted to the Inquiry on Federal Water Policy by the British Columbia Water Well Drilling Association*** * In: Inquiry on Federal Water Policy : Vancouver, British Columbia, November 19-23, 1984 * Nov 1984 * vp

Two major recommendations are put forward. Firstly, an ongoing program of mapping surficial geology is required to permit proper development and assessment of groundwater resources in Canada with the Geological Survey of Canada being the most qualified to carry out this work. Secondly, problems of pollution and contamination from industrial wastes and garbage dumps will increase and joint federal-provincial research programs should be undertaken to address these problems. Attached is a brief from the Aqua-Flo Testing and Equipment Ltd. stressing the need to treat groundwater resources as a natural resource in any water policy and their efforts at protecting and ensuring groundwater quality. Also attached is a letter from the BC Water Well Drilling Association which stresses that the Canadian Water Well Association is committed to groundwater resources protection, public education, promoting importance of the resource and providing information to contractors. A corresponding transcript of hearings in Vancouver addressing this submission is attached.

113 (073366)
BRITISH COLUMBIA WATERSHED PROTECTION ALLIANCE * ***Brief of British Columbia Watershed Protection Alliance to the Inquiry on Federal Water Policy*** * In: Inquiry on Federal Water Policy : Vancouver, British Columbia, November 19-23, 1984 * Nov 1984 * vp

This brief suggests means by which water policy and watershed management may effectively protect ecosystems and may involve people affected in meaningful ways. Suggestions for water policy and legislation include: joint federal/provincial initiatives to plan and carry out watershed planning and management; watersheds should form the boundaries for most government functions; recognition of the interconnection of all ecosystem factors; reality of cumulative effects which arise when water is mismanaged; and objective land use decisions must be based on complete, objectively collected data. Attached to this brief are supporting documents from other member groups of the British Columbia Watersheds Protection Alliance. Also attached is a corresponding transcript of the hearings in Vancouver addressing this submission. One particular area explored is resource management planning.

114 (073344)
CACCIA, C. * ***Brief of the Honourable Charles Caccia to the Inquiry on Federal Water Policy*** * In: Inquiry on Federal Water Policy : Ottawa, Ontario, December 3-10, 1984 * 1984? * vp

A national data bank of water resources and projections of Canada's future projected uses and requirements is recommended because watercourses and watersheds extend beyond local, regional, provincial and federal boundaries. Several areas of water resources management are addressed including water quality, water sharing, water pollution, cleanup operations, groundwater quality and agriculture, water scarcity, water loss, improper use of water, acid rain, water quality effects on forests and fish, greenhouse effect on water supply, and water exports. Cooperation between the federal and provincial governments is essential. The corresponding transcript of the hearings in Ottawa addressing this submission is attached.

115 (073501)
CALGARY AQUARIUM SOCIETY * ***Chloramine treatment of water - a cure that is worse than the disease*** * In: Inquiry on Federal Water Policy : Calgary, Alberta, October 9 & 10, 1984 * Sept 1984 * vp

This personal submission recommends to the Inquiry that chloramines not be used instead of chlorine for drinking water disinfection as is being done in the United States. Any methods of water treatment to replace chlorination should be thoroughly tested. Chloramine treatment should be prohibited in Canada on the grounds that it has been proven harmful to fish and humans. Massive fish kills and severe anemia in kidney-dialysis patients has been reported as a result of chloramines. Chlorine treatment of water is believed to be generating trihalomethane, a carcinogen. A corresponding transcript of hearings in Calgary addressing this submission is attached.

116 (073410)
CAMERON, D. * ***Brief of Mr. Douglas Cameron to the Inquiry on Federal Water Policy*** * In: Inquiry on Federal Water Policy : Winnipeg, Manitoba, October 24, 1984 * Oct 1984 * vp

This submission focuses on the supply and quality of water which might be developed for southern Manitoba to meet future requirements in domestic, industrial, recreational, wildlife and agricultural areas. Five suggestions are presented: improve wildlife management practices to negate present and future pollution of Souris River in North Dakota; investigate acid rain pollution from Saskatchewan Power Corporation coal-fired plants; consider additional electrical biotz control center at border crossing of Souris River in Manitoba; consider Manitoba's more favourable negotiating position for American water as related to a renewed interprovincial interest in Nelson River power; and consider gravity distribution and disposition of potable water to support an electrically powered center pivot type irrigation of high protein crops. Copies of other presentations made by the presenter on the same subject form part of this brief. A corresponding transcript of hearings in Winnipeg addressing this submission is attached.

117 (073495)
CANADA WEST FOUNDATION * ***Managing western and northern Canada's water resources*** * In: Inquiry on Federal Water Policy : Calgary, Alberta, October 9 & 10, 1984 * Oct 1984 * vp

Recommendations regarding federal government policy and action in the field of water resource management are presented. These include establishment of a national water management goal toward which government management agencies could work; control over water resources planning and management should be maintained by provincial governments; federal/provincial/territorial government cooperation is needed to negotiate interjurisdictional agreements regarding transboundary waters; continuation of funding by the federal government in relation to resource management; promotion of public participation and information dissemination; and better coordination of activities of various federal government water management agencies. A corresponding transcript of hearings in Calgary addressing this submission is attached. Areas explored are the role of the federal government in interjurisdictional matters and water pricing.

118 (073316)
CANADIAN ARCTIC RESOURCES COMMITTEE * ***Northern waters: the management challenge*** * In: Inquiry on Federal Water Policy : Ottawa, Ontario, December 3-10, 1984 * Dec 1984 * vp

In addressing the question of the best way to manage northern natural resources, this brief recommends that land- and water-use planning should be started now in the Yukon and Northwest Territories, and that the territorial governments and territorial water boards should take over all water management functions currently administered by the federal Department of Indian Affairs and Northern Development. Setting priorities for water use, conserving and non-consumptive uses of water, licensing and authorizing water use, and integrating land and water management are described. The residual federal role in northern water policy and management and an expanded policy research role for the Northwest Territories Science Institute are also described. Detailed sections are presented on planning for northern resource management, the conservation interest in northern water, the question of jurisdiction, and implementation of the Northern Inland Waters Act, interjurisdictional issues and research in the North. A transcript of hearings in Ottawa with questions on specific aspects of the brief is also included.

119 (073568)
CANADIAN COALITION ON ACID RAIN * ***Statement to the Inquiry on Federal Water Policy : Canadian Coalition on Acid Rain*** * In: Inquiry on Federal Water Policy : Toronto, Ontario, October 31st to November 2, 1984 * 01 Nov 1984 * vp

This brief answers the three questions on acid rain put forward in the Inquiry's participation paper Water is a Mainstream Issue. The question on causes of acid rain is answered by findings from four key Canadian documents which discuss the Experimental Lakes projects, sulphate target loading and groundwater contamination. The second question, on adequate cooperative arrangements to effect solutions, is answered by outlining activities of federal/provincial groups on acid rain abatement. The third question, on the extent to which the federal government should initiate policy, is answered by outlining many reasons why the federal government should take the lead role in the protection of Canadian aquatic resources from acid precipitation. Included in the attachments to this brief is a paper Acid Precipitation in Quebec and its effects on the aquatic environment. A corresponding transcript of hearings in Toronto addressing this submission is attached. Areas explored are the need for more public

information, funding for acid rain cleanup and acid rain in the United States.

120 (073552)
CANADIAN ENVIRONMENTAL LAW ASSOCIATION • ***Submissions to the Inquiry on Federal Water Policy : Canadian Environmental Law Association*** • In: Inquiry on Federal Water Policy : Toronto, Ontario, October 31st to November 2, 1984 • Oct 1984 • vp

This submission focuses on water quality by discussing the nature of the problem and constitutional considerations, and examining major pieces of relevant legislation including the Fisheries Act, Canada Water Act, Environmental Contaminants Act, Pest Control Products Act, Clean Air Act and the Great Lakes Water Quality Agreement. The need for a comprehensive national groundwater strategy and for a federal safe drinking water legislation is addressed. This brief contends the federal government has the constitutional authority to act in the area of toxic chemical control and the protection of water quality in Canada. Recommendations presented address both reforms to existing law and policy as well as suggested new initiatives to be pursued by the federal government. These initiatives are aimed primarily at giving priority status to the development of federal safe drinking water legislation and developing a groundwater protection strategy in consultation with the provinces and the public. A corresponding transcript of hearings in Toronto addressing this submission is attached. Areas explored are the federal government's role in water quality management and the effectiveness of existing legislation.

121 (073570)
CANADIAN ENVIRONMENTAL LAW RESEARCH FOUNDATION • ***Water quality and airborne toxics : symbol of the next generation of environmental problems*** • In: Inquiry on Federal Water Policy : Toronto, Ontario, October 31st to November 2, 1984 • 02 Nov 1984 • vp

This submission sketches the broad outline of the problem of toxic contamination resulting from atmospheric deposition and identifies the major issues and new environmental problems which must be considered in fashioning an integrated, interjurisdictional and interagency regulatory response. The need for an integrated law and policy response recognizing the connection between all parts of the natural environment and cutting across political and administrative boundaries is stressed. The federal government should expand upon early experiments in an integrated approach to environmental management. The uncertain, incomplete and constantly changing data based upon which any regulatory response must rest is examined. This can be done by recognizing the place of values in scientific information, separating scientific and policy-making processes and protecting public interest by accountability mechanisms. A corresponding transcript of hearings in Toronto addressing this submission is attached.

122 (073326)
CANADIAN LABOUR CONGRESS • ***Submission by the Canadian Labour Congress to the Federal Water Inquiry (the Pearse Commission)*** = Mémoire du Congrès du travail du Canada à la Commission fédérale d'enquête sur la politique fédérale relative aux eaux (Commission Pearse) • In: Inquiry on Federal Water Policy : Ottawa, Ontario, December 3-10, 1984 • Oct 1984 • vp

Water policy issues most likely to affect labour in the mid-term future are shown to be demand management, mandatory drinking water standards and effluent regulations, sustainable development, interbasin water transfer and regional water planning, land use, and environmental quality. It is stressed that workers have the rights to a job and to an adequate, clean water supply for the plant and community. The need for equity between labour and management in the work place when considering water policy is summarized as four rights: right to know, right to refuse, right to participate, and right to trust one's government. Appended to this brief are a selection of resolutions on water policy passed at Canadian Labour Congress conventions and relevant statements from affiliated unions and provincial federations of labour. The corresponding transcript of the hearings in Ottawa addressing this submission is attached.

123 (073431)
CANADIAN METEOROLOGICAL AND OCEANOGRAPHIC SOCIETY, SCIENTIFIC COMMITTEE • ***A glimpse of the role of river runoff in the sea : it's not wasted, it's part of the pattern*** • In: Inquiry on Federal Water Policy : Halifax, Nova Scotia, September 18 to 19, 1984 • Sept 1984 • vp

The image that runoff waters from the frozen North are being wasted is seen to be outdated in the light of recent oceanographic research findings. The revised image suggests that the immense spring freshets of northern rivers form part of the pattern of marine climate and marine biology. Various oceanographic results are presented to indicate the linkages between runoff, estuarine currents, coastal currents and large-scale atmospheric and ocean patterns. The revised image has implications for river regulation and water diversion policy. New proposals should be scrutinized more closely because the perceived context is now expanded. Water conservation should be practiced by Canadians to maintain the demand for new supplies within sustainable bounds. A corresponding transcript of hearings in Halifax addressing this submission is attached. Focus is on the effects of interrupting seasonal flows and the magnitude of river flows. This transcript also addresses an unrecorded submission on the same subject. Areas explored are the association between river discharge patterns and the subsequent catches of commercial landings of fish and the development of stratification in terms of temperature and salinity.

124 (073571)
CANADIAN NATIONAL COMMITTEE OF THE SIERRA CLUB * ***Canadian National Committee of the Sierra Club submission to the Inquiry on Federal Water Policy*** * In: Inquiry on Federal Water Policy : Toronto, Ontario, October 31st to November 2, 1984 * 1984 * vp

This brief proposes three fundamental principles or directions for federal water policy in the next decade. These are that water in use be given a more realistic value; that water resources be inventoried and portions be left substantially unused for future generations; and that the Canadian public be fully informed concerning water issues and solutions. The need to pursue demand management through rational water pricing and adoption of water conservation practices is stressed. Ways to implement the three proposals are outlined. A corresponding transcript of hearings in Toronto addressing this submission is attached. Areas explored are water pricing and the need for better water conservation.

125 (073311)
CANADIAN NATURE FEDERATION * ***Naturalists' perspectives on Federal Water Policy*** * In: Inquiry on Federal Water Policy : Ottawa, Ontario, December 3-10, 1984 * Nov 1984 * vp

The focus of this submission is on wetlands and some of Canada's river systems as well as policy concerns affecting both these types of water resources. The value of wetlands and the threats to wildlife due to their deterioration are described. Ecological threats to rivers like the St Lawrence and to northern deltas like the Mackenzie, Peace-Athabasca, Slave and Anderson deltas due to hydroelectric development, are discussed. Recommendations are presented on wetlands conservation, river systems management, pollution, erosion control, aquaculture, hydroelectricity, heritage rivers system, and the World Conservation Strategy. The corresponding transcript of the hearings in Ottawa addressing this submission is attached. Focus is on the need for broader application of the Canada Wildlife Act and for a national water use policy.

126 (073333)
CANADIAN PULP AND PAPER ASSOCIATION * ***Submission to the Inquiry on Federal Water Policy by the Canadian Pulp and Paper Association*** * In: Inquiry on Federal Water Policy : Ottawa, Ontario, December 3-10, 1984 * Nov 1984 * vp

This submission outlines the importance of water to the Canadian pulp and paper industry. It provides an overview of uses of water by the industry indicating how water is involved in the multifaceted task of producing pulp and paper. The issues involved in water management are discussed. These include the jurisdictional question, international pressures for the export of water and conflicts of use. Some recommendations are offered on a number of issues including industry water needs, research and development needs, conflict resolution and water export. The corresponding transcript of the hearings on this submission is attached. Some areas explored are elements of the Fisheries Act and pollution abatement and forestry research.

127 (073318)
CANADIAN SOCIETY OF ENVIRONMENTAL BIOLOGISTS * ***The Canadian Society of Environmental Biologists : brief to the Inquiry on Federal Water Policy*** * In: Inquiry on Federal Water Policy : Ottawa, Ontario, December 3-10, 1984 * Dec 1984 * vp

In this brief, the basic premise for Canada's water policy is that water management policy must be developed within a framework of an integrated, ecological approach which considers such aspects as land use, waste management and water management as integral parts of the task of managing and protecting Canada's water resources. Water management policies should promote an environmental ethic and recognize that people are only a part within the ecosystem. The place of land use planning, supply and demand management, coordination of efforts, preventive approach in dealing with water quality, and water quantity in determining sound water use policies are described. The corresponding transcript of the hearings in Ottawa addressing this submission is attached. The need for federal leadership in creating a national approach to water management is stressed in some of the responses.

128 (073332)
CANADIAN WATER RESOURCES ASSOCIATION * ***Brief to the Inquiry on Federal Water Policy prepared by the Canadian Water Resources Association*** * In: Inquiry on Federal Water Policy : Ottawa, Ontario, December 3-10, 1984 * Dec 1984 * vp

This brief presented by Andrew J. Robinson comments on water management issues in general with the main focus on federal policies relating to water management. Specific concepts or issues in which the federal government must play a significant role are watershed management, water transfer, water supply, water quality standards, hydroelectric development, fisheries, wetlands preservation, flood damage reduction, and heritage rivers. The process of water management, jurisdictional issues, and public education and information are described. This brief concludes that although the provinces are the best custodians of water resources within their boundaries, the federal government has a role to play as a lead organization in several key areas. The corresponding transcript of the hearings on this submission is attached.

129 (073404)
CANADIAN WATER WELL ASSOCIATION * ***Brief to the Inquiry on Federal Water Policy : prepared by the Canadian Water Well Association*** * In: Inquiry on Federal Water Policy : Winnipeg, Manitoba, October 24, 1984 * Oct 1984 * vp

Four areas of concern to the Canadian Water Well Association are water resource definition and resource information, water research and planning, water regulation, and water infrastructure development and

maintenance. This last area poses the greatest concern since the daily water needs of all Canadians depend on proper development and maintenance of water infrastructure including water supply and waste disposal systems. Failure to achieve this creates a shortfall in water services and costly restoration projects. Adequate technical and financial resources are required to achieve optimum development. The Association looks to all levels of government to create a coordinated, organizational framework which can develop and deliver water programs that will be effective in achieving optimum development of Canada's water resources. A corresponding transcript of hearings in Winnipeg addressing this submission is attached. Areas explored are need for standards and regular inspection of well drilling and maintenance and the importance of good groundwater supply.

130 (073317)
CANADIAN WILDLIFE FEDERATION * ***Submission to the Inquiry on Federal Water Policy : Canadian Wildlife Federation*** * In: Inquiry on Federal Water Policy : Ottawa, Ontario, December 3-10, 1984 * Dec 1984 * vp

Concerns of the Canadian Wildlife Federation on the protection, conservation and effective management of Canada's wildlife resources and wildlife habitat are outlined. The problems of deposition of toxic and industrial wastes and acidic precipitation into rivers and lakes and the adverse effects of these wastes on wildlife are escalating. This water quality deterioration is contributing to the decline and destruction of fish habitat and Canada's recreational fishery. Wetland wildlife habitats continue to be threatened particularly by hydroelectric power development and diversion of watercourses. This brief stresses that a national water policy must be developed if federal-provincial jurisdictional questions are to be overcome. The spirit of the Canada Water Act must be resurrected and implemented so that people and wildlife are guaranteed clean water supply. The corresponding transcript of the hearings in Ottawa addressing this submission is attached.

131 (073372)
CARRIER SEKANI TRIBAL COUNCIL * ***Carrier Sekani Tribal Council presentation for the Inquiry on Federal Water Policy*** * In: Inquiry on Federal Water Policy : Vancouver, British Columbia, November 19-23, 1984 * Nov 1984 * vp

Two projects in British Columbia that had an immense impact on the Indian people as well as on water policy for Canada are described. Both projects were within traditional territory of the Carrier Sekani Tribal Council. They are the Bennett Dam and the resulting Williston Reservoir on the Peace River system and the Kenney Dam on the Nechako River, constructed to create the power necessary for the operation of Alcan's aluminum smelter in Kitimat. Effects of these projects on the Indian way of life and livelihood are stressed. They illustrate that the Canadian government has no policy with regard to the protection of Indian interests in the waters found in their traditional territories. This submission urges that any water policy for Canada must have a judicial type process to ensure a full and complete review of any project proposed to utilize water. The federal government must exercise its jurisdiction and not leave it entirely to the provinces. A corresponding transcript of hearings in Vancouver addressing this submission is attached.

132 (073397)
CARTER, R.L. * ***Brief to the Inquiry on Federal Water Policy presented by: R.L. Carter*** * In: Inquiry on Federal Water Policy : Winnipeg, Manitoba, October 24, 1984 * 1984? * vp

This brief discusses the need for provincial/federal cooperation in such areas as water surveys, water quality, research, pricing, conservation, flood protection and heritage area preservation. Some of the basic concerns in water management in Manitoba are identified: lack of a long-term secure and adequate water supply; need for better flood protection and control; need to expand pricing policies; better education concerning information on soil and water management; need for a watershed approach to water management; and need to preserve heritage areas and outdoor recreation resources. A corresponding transcript of hearings in Winnipeg addressing this submission is attached. Areas explored are water pricing and federal/provincial relations in water management.

133 (073493)
CITY OF CALGARY * ***Municipal issues in water management*** * In: Inquiry on Federal Water Policy : Calgary, Alberta, October 9 & 10, 1984 * Sept 1984 * vp

This brief responds to issues identified in the Inquiry on Water Policy's participation paper from the perspective of the city of Calgary. It identifies initiatives and actions that the city has already taken with regard to the various identified issues, identifies continuing concerns the city has on water quality coming into and leaving the city, discusses the causes of these concerns and limitations on the city taking further action, emphasizes those areas where the federal government should adopt policies, and undertake research or initiate action or funding to improve water management in Canada. Sixteen specific recommendations on water quantity, quality, and water management and research are presented. A corresponding transcript on hearings in Calgary addressing this submission is attached. Areas explored are water pricing, drinking water quality standards, the federal role, federal government programs, and assistance for municipal wastewater treatment facilities.

134 (073425)
CITY OF SAINT JOHN * ***Brief to the Inquiry on Federal Water Policy from the city of Saint John*** * In: Inquiry on Federal Water Policy : Fredericton, New Brunswick, September 20, 1984 * Sept 1984 * vp

This submission details concerns by the city of Saint John which must be addressed in any federal water policy. These include available funding to examine causes of the acid rain problem and its effect on water supplies; policy of consultation rather than legislation in setting national drinking water standards; discouraging conflicting use of potable water supplies for heat pumps; enactment of new policies providing financial assistance to municipalities for water and sewage treatment facilities; and funding research into water and sewage problems caused by environmental and technological changes. A corresponding transcript of hearings in Fredericton addressing this submission is attached. Areas explored are the rehabilitation of the Saint John's water system and the back flow concept in water distribution and supply.

135 (073406)
CITY OF WINNIPEG * ***Brief submitted by the city of Winnipeg to the Inquiry on Federal Water Policy*** * In: Inquiry on Federal Water Policy : Winnipeg, Manitoba, October 24, 1984 * Sept 1984 * vp

Problems that a municipal government can encounter in protecting its water supply are discussed by presenting the Shoal Lake situation as a case study in the city of Winnipeg where the water supply for 600 000 residents is facing developmental threats. Issues and recommendations in the areas of jurisdiction, water quality and land use are stated with the hope that the city of Winnipeg can be assisted in protecting its water supplies. Specific recommendations are that the federal government take the lead role to achieve federal/provincial/city agreements; that the federal government issue water quality regulations to prevent degradation of exceptional water quality lakes like Shoal Lake; and that all three levels of government prohibit development in the Shoal Lake watershed. A corresponding transcript of hearings in Winnipeg addressing this submission is attached.

136 (073364)
COAST MOUNTAIN AQUASOURCE LTD. * ***Brief of Coast Mountain Aquasource Ltd. to the Federal Inquiry on Water*** * In: Inquiry on Federal Water Policy : Vancouver, British Columbia, November 19-23, 1984 * Nov 1984 * vp

This three-part brief contains answers to and comments on the participation paper by the Inquiry on Federal Water Policy entitled Water is a Mainstream Issue; general information and opinions concerning the general practice of the export of water by marine transportation from remote coastal streams with the focus on British Columbia; and information on Freil Lake selection as the source of water for export by marine transportation after a detailed survey of other potential British Columbia coastal sources. Each section is accompanied by supporting information including quotations from miscellaneous sources and copies of correspondence to and from various referral and regulatory agencies. A corresponding transcript of hearings in Vancouver addressing this submission is attached. A particular area explored is water export and general policy rationale.

137 (073403)
COLEY, R.; COWAN, W.F. * ***Submission from Ducks Unlimited to Inquiry on Federal Water Policy*** * In: Inquiry on Federal Water Policy : Winnipeg, Manitoba, October 24, 1984 * 1984? * vp

This brief describes how existing policies that provide for maximizing Canada's agricultural output influence land use and economic decisions that often initiate water and soil management problems. Clear cultivation for grain production and clearing and draining of marginal lands reduce soil productivity, cause environmental damage, and eradicate and degrade wildlife habitat. Recommendations to solve these problems include use of a resource management model that provides economic incentives for farmers to use conservation-minded cropping methods and preserve native habitats; a strong extension/education program; and increased use of wildlife programs. A second brief outlines the same concerns and recommendations with the addition of watershed conservation districts for better control and monitoring. A corresponding transcript of hearings in Winnipeg addressing this submission is attached. Areas explored are the role of the Prairie Farm Rehabilitation Association, the role of Environment Canada in water policy administration and better incentives for farmers.

138 (073330)
COMMUNIST PARTY OF CANADA * ***Brief of the Communist Party of Canada to the Inquiry on Federal Water Policy (sic)*** * In: Inquiry on Federal Water Policy : Ottawa, Ontario, December 3-10, 1984 * Nov 1984 * vp

The adoption of an all-Canadian water policy as part of an overall orientation of industrial development of the country is stressed in this submission. The component parts of such a policy should include opposition to the export of Canadian water to the United States; need for a unified water system in Canada with due regard to federal and provincial rights; and the necessity of ending pollution of rivers, lakes and forests in Canada. Water pollution in the United States and failure to abate this pollution should be taken by Canada to the United Nations World Court of Justice to focus public opinion on the harm caused to Canada. Adequate legislation is required in Canada for industrial polluters and hazardous chemical control. The corresponding transcript of the hearings in Ottawa on this submission is attached.

139 (073572)
CONCERNED CITIZENS FOR WATER LEVEL MANAGEMENT * ***Submission to the Inquiry on the Federal Water Policy : Concerned Citizens for Water Level Management*** * In: Inquiry on Federal Water Policy : Toronto, Ontario, October 31st to November 2, 1984 * 31 Oct 1984 * vp

Effects of increasing the Severn River's flow through the village of Washago, Ontario, are examined. These include wasting of 30% of potential electric power, leaving the eggs of muskie, northern pike and walleye high and dry when water levels fluctuate during spawning season, and making travel hazardous for small boats. Causes of high water levels are detailed. It is recommended that the federal policy of users pay be reaffirmed; CORTS (Canada, Ontario, Rideau, Trent, Severn) Advisory Committee be reconvened; changes to published water levels and flows by Water Survey of Canada be flagged and the amount of change indicated; and access to information on flow and gauge data be made easier. A corresponding transcript of hearings in Toronto addressing this submission is attached.

140 (073381)
CONCERNED CITIZENS OF PEACHLAND * ***Submission of the Concerned Citizens of Peachland to the Inquiry on Federal Water Policy*** * In: Inquiry on Federal Water Policy : Kelowna, British Columbia, November 28, 1984 * Nov 1984 * vp

This submission on behalf of concerned citizens in Peachland, British Columbia details the pollution of the Deep Creek and Peachland Irrigation District drinking water system and seepage into Trepanier Creek by Brenda Mines tailings pond waste discharge. A brief history of the problem is presented. A second concern is the proposed application by the Okanagan Water Basin Board to apply the herbicide 2,4-D to Okanagan Lake to kill Eurasian water milfoil weed. A detailed history of events, conclusions and recommendations based on research on 2,4-D are presented. Recommendations focus on the need for a better system of drinking water standards covering a wider range of substances and for stronger laws for corporations to disclose chemicals they use. A letter to the Inquiry on both concerns is also included. A corresponding transcript of hearings in Kelowna addressing this submission is attached.

141 (F13135)
CONGRÈS DU TRAVAIL DU CANADA * ***Mémoire du Congrès du travail du Canada à la Commission d'enquête sur la politique fédérale relative aux eaux (Commission Pearse)*** = Submission by the Canadian Labour Congress to the Federal Water Inquiry (the Pearse Commission) * In: Transcript of hearings : Inquiry on Federal Water Policy, Ottawa, Ontario, December 3-10, 1984 * Oct 1984 * pd

Ce document fait part du point de vue du Congrès du travail du Canada sur les questions de politique de l'eau. Le mémoire est divisé en quatre grandes rubriques. La première s'intitule Pourquoi un mémoire du mouvement syndical sur la politique de gestion de l'eau et la seconde Quels aspects de la politique de gestion de l'eau auront des répercussions sur les travailleurs. Le troisième chapitre montre comment emplois et environnement sont indissociables, et la quatrième partie met l'accent sur les droits des travailleurs en ce qui concerne la politique de gestion de l'eau. En conclusion, le Congrès énonce les orientations que le Canada doit éviter de prendre. Ce document est suivi de quatre annexes.

142 (073418)
CONSERVATION AND DEVELOPMENT ASSOCIATION * ***Presentation of the Conservation and Development Association to the Inquiry on Federal Water Policy*** * In: Inquiry on Federal Water Policy : Regina, Saskatchewan, October 22, 1984 * 1984? * vp

The problem of surplus surface water accumulating on Class 5, subclass w land scattered throughout Class 1, 2 and 3 lands following snowmelt or heavy spring and summer rains in Saskatchewan is addressed. An historical background of water management legislation in Saskatchewan, scope for flood control and development, importance of flood control, and federal and provincial responsibilities are outlined. The Conservation and Development Association concludes that the economic survival of many farming units is dependent on the control and removal of surplus surface water and strongly recommends that a federal water policy recognizing the desires and needs of the farming population be formulated. A corresponding transcript of hearings in Regina addressing this submission is attached.

143 (073553)
CONSERVATION COUNCIL OF ONTARIO * ***Emerging water issues in Canada : Conservation Council of Ontario*** * In: Inquiry on Federal Water Policy : Toronto, Ontario, October 31st to November 2, 1984 * 1984 * vp

This submission expresses concern that large-scale diversions of water into or out of the Great Lakes Basin could markedly disrupt the ecological balance in the basin ecosystem. Scientific studies based on an ecosystem approach focusing primarily on ecological phenomena rather than on traditional political, economic, engineering and jurisdictional perspectives are needed. Conservation measures to lessen the demand for interbasin transfers must give attention to the irrigation of agricultural lands. With respect to water quality, the problems associated with acid deposition, domestic waste discharge, agricultural runoff, hazardous industrial wastes and effluents have been identified. An urgent need exists for preventative and restorative processes based on an ecosystem approach with a biospheric perspective. A corresponding transcript of hearings in Toronto addressing this submission is attached. Areas explored are irrigation and water use and federal/provincial water policy.

144 (073360)
CONSUMERS' ASSOCIATION OF CANADA (BRITISH COLUMBIA BRANCH) * ***The submission of the Consumers' Association of Canada (British Columbia Branch) to the Inquiry on Federal Water Policy*** * In: Inquiry on Federal Water Policy : Vancouver, British Columbia, November 19-23, 1984 * Nov 1984 * vp

The Consumers' Association of Canada is deeply concerned that the current economic climate will continue to generate support in government and corporate circles for the increased and continued loading of water systems with pollutants as an economic boost for troubled corporations. Accordingly, the Association makes several recommendations in the areas of an Environmental Bill of Rights, water quantity, water quality, watershed management and jurisdictional issues. A major recommendation is the creation of an Information Secretariat on Water. This Secretariat would assist in coordinating development of local water management strategies; act as a single access point for technical and general information on water matters; and coordinate access to technical expert staff of Environment Canada and other departments. A corresponding transcript of hearings in Vancouver addressing this submission is attached. Areas explored include federal versus national strategies and policies.

145 (F13124)
CORBEIL, J. • ***Intervention de M. Jean Corbeil devant le Comité d'enquête sur la politique fédérale relative aux eaux*** • In: Transcript of hearings : Inquiry on Federal Water Policy, Montréal, Québec, November 5 & 6, 1984 • 05 nov 1984 • 5p

Dans cette présentation, l'auteur expose brièvement les préoccupations des municipalités québécoises face à la problématique de l'assainissement des eaux. En date de la conférence, la moitié des municipalités sont desservies par un réseau d'égouts et à peine le dixième de la population est desservie par un système d'épuration. Pourtant, le gouvernement du Québec a lancé en 1978 un vaste programme d'assainissement des eaux, avec des investissements provinciaux et municipaux considérables. Le problème majeur réside dans le manque de sensibilisation de la population aux avantages de la dépollution des eaux. L'auteur suggère que le gouvernement fédéral contribue financièrement au programme, d'autant plus que les problèmes environnementaux requièrent l'action concertée de tous les niveaux de gouvernement et de l'ensemble des intervenants. À la suite de la présentation, quelques questions sont posées à l'auteur par les membres du comité d'enquête.

146 (073374)
CORPORATION OF THE DISTRICT OF PEACHLAND • ***Brief of the Corporation of the District of Peachland to the Inquiry on Federal Water Policy*** • In: Inquiry on Federal Water Policy : Kelowna, British Columbia, November 28, 1984 • Oct 1984 • vp

This submission expands on a resolution adopted by the Municipal Council of the Corporation of the District of Peachland on the need to protect water quantity and quality. The main points of the resolution are to safeguard Canada's water needs before considering water export; to formulate a Federal Safe Water Act encompassing all chemicals entering Canada's water supplies; to impose more effective regulations on issuance of permits for sewage and industrial waste discharge; and to incorporate water-testing results done in other countries into federal water standards for Canada. A corresponding transcript of hearings in Kelowna addressing this submission is attached. Areas explored are the need for federal intervention to impose enforceable legislation relating to minimum standards for water quality and the need for stricter drinking water quality standards.

147 (073361)
COUNCIL OF FOREST INDUSTRIES OF BRITISH COLUMBIA • ***Inquiry on Federal Water Policy : submission by Council of Forest Industries of British Columbia*** • In: Inquiry on Federal Water Policy : Vancouver, British Columbia, November 19-23, 1984 • Nov 1984 • vp

Concerns of the forest industry in British Columbia are presented highlighting the industry's economic contribution, the industry as a water user, hydroelectric water requirements and the industry's activities in water quality protection. Specific observations include need for continuing low-cost, clean, fresh water in the pulp and paper sector; need for continuing utilization of saltwater and freshwater systems by the forest industry; environmental protection especially that fisheries habitat is protected by the forest industry; lead agency management policies are cost efficient and environmentally desirable; and the need for continuing availability of low-cost hydroelectric and other energy supplies. A corresponding transcript of hearings in Vancouver addressing this submission is attached. Areas explored are public participation and the referral system, the province's role in coordinated water resource management and the mandate of the Fisheries Act.

148 (073414)
CUMBERLAND HOUSE BAND • ***Brief to the Inquiry on Federal Water Policy from Cumberland House Band*** • In: Inquiry on Federal Water Policy : Regina, Saskatchewan, October 22, 1984 • Sept 1984 • vp

This submission describes the changes to the Indian way of life by the Saskatchewan Power Corporation hydroelectric development on the Saskatchewan River. The 1963 Squaw Rapids hydro project and the large Gardiner Dam construction upstream of Cumberland Lake seriously affected the travel, trapping, hunting, fishing and general life style of the Indian community living downstream. Water quality was seriously affected due to increased mercury. Regulation of the Saskatchewan River did not consider the rights and needs of downstream users. The negative impacts of these projects outweighed the benefits of electricity and all-weather roads to the community. Compensation for lost livelihood is being sought. The corresponding transcript of hearings in Regina addressing this submission is attached. Focus is on the decline of wildlife in the area.

149 (073356)
DAVIES, L.B. • ***Brief of L.B. Davies to the Inquiry on Federal Water Policy*** • In: Inquiry on Federal

Water Policy : Vancouver, British Columbia, November 19-23, 1984 * Nov 1984 * vp

The history of water resource developments in Canada with particular reference to the developments in British Columbia is described. The Canada Water Act is outlined with a discussion of the implications of the application or non-application of the principles embodied in the Act to water resources development in British Columbia. A proposal is presented for the establishment of a Federal-Provincial Water Resources Board which would continue and expand the research and planning studies carried out by the BC Hydro and Power Authority and assess the feasibility of exporting water from the province. A corresponding transcript of hearings in Vancouver addressing this submission is attached.

150 (073518)
DENE NATION * ***Water issues in Denendeh*** * In: Inquiry on Federal Water Policy : Yellowknife, Northwest Territories, October 16, 1984 * Oct 1984 * vp

The Dene nation stresses in this brief that until the question of ownership and aboriginal claims are settled, no licensing of resource use over which the Dene nation claims ownership should be granted. The ability to control what happens to their land and waters is the main focus of this brief's comments and recommendations. The existing licensing system in the Northwest Territories is examined and changes are recommended. Other major concerns include the ongoing construction of hydroelectric dams and the need to have representation on any water discussions so as to protect aboriginal interests. The fear exists that recent federal initiatives designed to streamline the regulatory process will ignore aboriginal concerns and claims. A corresponding transcript of hearings in Yellowknife addressing this submission is attached.

151 (073323)
DEPARTMENT OF FISHERIES AND OCEANS * ***Submission to the Inquiry on Federal Water Policy : Department of Fisheries and Oceans*** = Rapport présenté au Comité d'enquête sur la politique fédérale relative aux eaux : Ministère des Pêches et des Océans * In: Inquiry on Federal Water Policy : Ottawa, Ontario, December 3-10, 1984 * Dec 1984 * vp

Views of the Department of Fisheries and Oceans respecting the policies, programs and jurisdictional arrangements intended to promote cooperative planning and management by the various agencies responsible for Canada's fresh water are discussed. This submission expands upon issues of acid rain, freshwater quality management, jurisdiction, effects of climatic change, water quantity, contamination by toxic chemicals, freshwater habitats, and effects of water quality on the fisheries resource. Details are provided on the objectives and mandate of the Department and the economic importance of freshwater fisheries. The status of the proposed Fish Habitat Management Policy and ways to provide for habitat restoration and development are outlined. Detailed is the departmental agenda for action to maintain and improve conditions to ensure that the current level of production continues and increases. The corresponding transcript of the hearings in Ottawa addressing this submission is attached.

152 (073309)
DEPARTMENT OF NATIONAL HEALTH AND WELFARE * ***Water and human health*** * In: Inquiry on Federal Water Policy : Ottawa, Ontario, December 3-10, 1984 * Nov 1984 * vp

Seven areas which the Department of National Health and Welfare consider important in a discussion of drinking water quality are raw water quality; substances used or arising in water treatment and distribution systems; effectiveness of treatment in improving water quality; training of waterworks operators; guidelines and standards for drinking water quality; drinking water monitoring and surveillance; and the role of the Department. Departmental activities with respect to recreational water quality and what remains to be done in the future are outlined. Federal-provincial and international cooperation on safe drinking water are described. The corresponding transcript of the hearings in Ottawa addressing this submission is attached.

153 (073578)
DEPARTMENT OF PUBLIC HEALTH * ***Inquiry on Federal Water Policy : a submission from Department of Public Health, Toronto, Ontario*** * In: Inquiry on Federal Water Policy : Toronto, Ontario, October 31st to November 2, 1984 * Sept 1984 * vp

This brief outlines some of the problems associated with the environmental and public health aspects of a federal water policy. Emphasis is on Toronto's water quality problems. Sources of chemical contaminants to Lake Ontario which could affect Toronto's drinking water are described. Toronto's current filtration and disinfection system are also a source of concern. Investigation of the structure of Canadian drinking water management shows that the Canada, Ontario and other provincial drinking water standards require revision, and that there is a widening gap between ability to detect the presence of contaminants in drinking water and the ability to interpret these data for human health. The chemical quality of Toronto's drinking water and the bacteriological quality of Toronto's beaches are discussed. Three advocacy positions are suggested for discussion by which the United States could reduce the contamination of the Niagara River: reducing atmospheric deposition; improving sewage effluent quality; and studying in-place pollutants. It is recommended that the federal government continue funding projects studying biological indicators; alternative water filtration and disinfection processes be instituted; current drinking water legislation be revised; and health effects of contaminants be further researched. A corresponding transcript of hearings in Toronto addressing this submission is attached.

154 (073322)
DEPARTMENT OF THE ENVIRONMENT * ***Issues and options : submission by the Department of the Environment to the national hearing of the Inquiry on Federal Water Policy*** = Enjeux et options : mémoire du ministère de l'Environnement à l'audience nationale du Comité d'enquête sur la politique fédérale relative aux eaux * In: Inquiry on Federal Water Policy : Ottawa, Ontario, December 3-10, 1984 * Dec 1984 * vp

Issues and options are identified in several areas of water quantity, water quality, water management, and jurisdictional needs. Water quantity issues include availability of ground water and diversions or water transfer and natural hazards, specifically flood damage reduction, prairie drought, and climate change. Water quality coverage includes a national assessment, water quality objectives, acid rain, toxic substances, and waste effluents. The water management section identifies overall trends in water use, instream uses, improved water use forecasting, water demand, water pricing, cooperative and regional planning, water use modelling, wetlands preservation, estuaries and deltas, water infrastructure and involvement. Jurisdictional needs address the question of federal-provincial-territorial uses, Canada-United States issues, and water export. The corresponding transcript of the hearings in Ottawa addressing this submission is attached. The focus at the hearings was on the federal government's role in water management and federal/provincial relations.

155 (073369)
DOBYNS, D.E. * ***Brief of Douglas E. Dobyns to the Inquiry on Federal Water Policy*** * In: Inquiry on Federal Water Policy : Vancouver, British Columbia, November 19-23, 1984 * Nov 1984 * vp

This submission presented by a commercial fisherman centers on four main areas: the present use of the Columbia River Treaty, focusing on how management of the Canadian reservoirs are being manipulated by the United States; economic situation in the hydroelectrical generating business in the Northwest and how this impacts on British Columbia's economy; how water politics are used to influence negotiations on related resource management such as the fishing talks; and new water management policies incorporating the principle of accountability to local residents. A corresponding transcript of the hearings in Vancouver addressing this submission is attached. Public participation in water management decisions and implications of the Columbia River Treaty are areas explored.

156 (073562)
DOFASCO INC. * ***Brief of Dofasco Inc. to the Inquiry on Federal Water Policy*** * In: Inquiry on Federal Water Policy : Toronto, Ontario, October 31st to November 2, 1984 * 1984 * vp

Dofasco believes that water quality should remain a major priority in addressing water issues. Although water quantity and consumption by the manufacturing sector has emerged as a major issue in addition to water quality, the company stresses that current and future consumption rates will not result in a significant reduction in water quantity. The goals of water quality and quantity are shown to be in conflict in the company's water treatment experience of recycling versus once-through approaches. It has been suggested that a tax be imposed to encourage a reduction in water consumption. Dofasco believes that a tax will not result in any significant reduction and submits that economic studies be undertaken to determine the significance of the impact on quantity and potential negative consequences on quality. The company is pleased with the efforts and strategies of both the provincial and federal governments in addressing water problems in the Great Lakes Basin. A corresponding transcript of hearings in Toronto addressing this submission is attached. Areas explored are water recycling, industrial water consumption and environmental quality control.

157 (073506)
DOMINION ECOLOGICAL CONSULTING LIMITED; RAWSON ACADEMY OF AQUATIC SCIENCE * ***Canadian waters : the future for research and management*** * In: Inquiry on Federal Water Policy : Calgary, Alberta, October 9 & 10, 1984 * Oct 1984 * vp

It is argued that significant economies may be realized and research production greatly enhanced by the application of techniques to harness the resources of the private research sector in Canada in conjunction with existing federal research establishments. Specifically, the role of agencies must be evaluated to find ways to secure long-term endowments for their operations and to encourage their programs in education, research and consultation regarding policies and management strategies so as to realize significant economies. Also, creation of a national body to replace the defunct Fisheries Research Board of Canada as a research-funding source across all jurisdictional boundaries for study of Canadian aquatic resources is urged. A corresponding transcript of hearings in Calgary addressing this submission is attached. Areas explored are the nature of the proposed national board and the need for a national view to manage natural resources.

158 (073504)
ELECTRIC UTILITY PLANNING COUNCIL OF ALBERTA * ***Submission to the Inquiry on Federal Water Policy by Electric Utility Planning Council of Alberta*** * In: Inquiry on Federal Water Policy : Calgary, Alberta, October 9 & 10, 1984 * Sept 1984 * vp

Water is an essential part of providing Albertans with the electricity they require. Most of Alberta's existing power plants are located in the southern river basins and the availability of water is a constraint on planning future generating projects. Alberta's greatest potential for hydro development is on its northern rivers. Both acid rain and electric generation are not major sources of water pollution. It is felt that the

provincial government is the most appropriate and efficient body to set regulations for generating projects unless they affect interprovincial waters; any discussion of interbasin transfer should realize potential effects on the hydro generation capacity of northern rivers; and the Mackenzie River Basin Agreement would ensure the orderly development of the basin's hydroelectric potential in the best interests of all users. A corresponding transcript of hearings in Calgary addressing this submission is attached.

159 (073407)
EMBERLEY, K. * ***Brief of Mr. Kenneth Emberley to the Inquiry on Federal Water Policy*** * In: Inquiry on Federal Water Policy : Winnipeg, Manitoba, October 24, 1984 * 1984? * vp

This submission details a multidiscipline approach to long-range planning for a sustainable future. Several areas are addressed including inappropriate technology choices, environmental destruction, better environmental management by business and government, alternatives to massive projects like the Garrison Diversion Project and need for more sensitive and perceptive engineers. A corresponding transcript of hearings in Winnipeg addressing this submission is attached. Areas explored are the contrast between appropriate and inappropriate technologies as sustainable strategy, implications of interrupting the great rivers that flow into Hudson Bay and the Arctic Ocean and government support to massive, high-profile industries.

160 (073526)
END OF THE LINE * ***Water issues in Brome-Missisquoi*** * In: Inquiry on Federal Water Policy : Montreal, Quebec, November 5-6, 1984 * July 1984 * vp

This submission is presented on behalf of End of the Line, a citizens committee involved in resolving many regional environmental problems. Water quality issues are addressed for six Brome-Missisquoi watersheds in Quebec - the Yamaska, the Missisquoi, the Pike, Missisquoi Bay, Lake Memphremagog and the Richelieu - and recommendations presented to rectify the problems. The role of the federal government, particularly Environment Canada, in water management for these watersheds is outlined. A paper examining public concerns on the use of asbestos residues, specifically the Eastern Townships asbestos line, is included with the submission. A corresponding transcript of hearings in Montreal addressing this submission is attached. Areas explored include jurisdiction of Environment Canada and Environnement Québec and the need for an ecological approach to water management.

161 (073327)
ENERGY, MINES AND RESOURCES * ***Brief to the Inquiry on Federal Water Policy : submitted by Energy, Mines and Resources*** * In: Inquiry on Federal Water Policy : Ottawa, Ontario, December 3-10, 1984 * Dec 1984 * vp

This brief stresses that energy and mineral policy decisions will have to be compatible with decisions reflecting water policy. Energy and mineral development need not necessarily be thought of as proceeding at the expense of water quality. The commitment to environmental protection is reflected in recent initiatives by the Department of Energy, Mines and Resources in the energy and mineral sectors. Some specific initiatives include research projects associated with disposal of wastes from the uranium and nuclear industries, the CANMET coal cleaning laboratory, and hydrogeologic research. The link between water availability and energy and expectations of the Department on water policy as a subset of environmental policy are discussed. The corresponding transcript of the hearings in Ottawa on this is attached. Focus is mainly on the submission effects of energy development on the environment especially the water environment.

162 (073512)
ENVIRONMENT CANADA, ATLANTIC REGION * ***A brief presented to the Inquiry on Federal Water Policy by Environment Canada, Atlantic Region*** * In: Inquiry on Federal Water Policy : St John's, Newfoundland, September 24, 1984 * Sept 1984 * vp

This brief outlines Environment Canada's perception of water issues and related needs in the Atlantic Region. Water issues are discussed under quantity, particularly scarcity and flooding; quality, including toxic chemicals, acid rain, saltwater intrusion, causeway projects, general effluent, and forest management; management issues, including legislation, technical information requirements, strategic planning, management for conservation, economic aspects of water management, and international issues; and research and education. Recommendations are presented in all four areas. A corresponding transcript of hearings in St John's addressing this submission is attached. Areas explored are strategic water planning and the role of the federal government, broadening of public understanding and awareness of water issues, water pricing, and need for consultation and coordination of government water management.

163 (073413)
ENVIRONMENT CANADA, INLAND WATERS DIRECTORATE, WESTERN AND NORTHERN REGION * ***Water and economic development in the prairie provinces*** * In: Inquiry on Federal Water Policy : Regina, Saskatchewan, October 22, 1984 * 1984? * vp

This submission focuses on the need of the federal government to have an appropriate strategy in place in the short term (1985-1989) to prepare for major changes in federal involvement in water resources planning and management in the Prairies required for the long term. This short-term period would serve to focus on the mechanisms for dialogue and needed adjustments in the federal system itself and give time to develop criteria for dealing with project proposals. Indications are that if current water use trends continue, lack of water could seriously restrict economic

development in the Prairie provinces. Three initiatives are suggested: continuation of initiatives recently approved but not yet implemented: new short-term initiatives; and a western water plan, a major federal/provincial effort to develop a set of water resources management objectives. A change in the federal approach to water management is needed to recognize that water resource development in support of economic development could be sustainable in terms of quantity and quality. A corresponding transcript of hearings in Regina addressing this submission is attached.

164 (073577)
ENVIRONMENT CANADA, ONTARIO REGION * ***Submission to the Inquiry on Federal Water Policy : Environment Canada, Ontario Region*** * In: Inquiry on Federal Water Policy : Toronto, Ontario, October 31st to November 2, 1984 * 25 Sept 1984 * vp

Key concerns and/or objectives for a federal water strategy as it applies to the Ontario Region and the Great Lakes, in particular, are sustainable development for multiple use and environmental security. The issues that block the achievement of these overall objectives are described as chemical contamination of water resources; physical modification and biological disruption; conflicting uses and institutional arrangements; and public concern. The multijurisdictional nature of Ontario Region's water resources, particularly the Great Lakes, is described. Several strategies are proposed to resolve these issues: governments must provide leadership and opportunities for public contribution to environmental quality; standards and regulations must be developed to eliminate toxic discharge at source; a federal mandate is needed to implement comprehensive Great Lakes water management action; and the education system must increase public ecological awareness. The federal mandate must be strengthened to put in place a legislative basis for regulation and control. A corresponding transcript of hearings in Toronto addressing this submission is attached.

165 (073362)
ENVIRONMENT CANADA, PACIFIC AND YUKON REGION * ***Regional submission to Inquiry on Federal Water Policy by Environment Canada, Pacific and Yukon Region*** * In: Inquiry on Federal Water Policy : Vancouver, British Columbia, November 19-23, 1984 * Nov 1984 * vp

This submission provides an overview of water resources in the Pacific and Yukon Region, identifies existing and potential water management issues, and outlines data collection and research priorities. Focus is primarily on those issues that are of direct importance to Environment Canada in the Region. Water management priorities and research needs that arise from these issues include water supply and demand imbalances, hydroelectric power developments, interbasin transfers, water export, estuaries, contaminants, floods, eutrophication, acid rain and ground water. The interjurisdictional nature of these priorities is stressed. Federal/provincial coordination and cooperation in water planning and management is seen as the dominant issue. A corresponding transcript of hearings in Vancouver addressing this submission is attached. Areas explored are Environment Canada's powers under the Canada Water Act, federal/provincial coordination under existing legislation and federal policy on inland waters.

166 (073505)
ENVIRONMENT CANADA, WESTERN AND NORTHERN REGION * ***A brief submitted to the Inquiry on Federal Water Policy by Environment Canada, Western and Northern Region*** * In: Inquiry on Federal Water Policy : Calgary, Alberta, October 9 & 10, 1984 * Sept 1984 * vp

This submission provides information on the water resources within the Northwest Territories and the provinces of Manitoba, Saskatchewan and Alberta, identifies present and future primary water issues and assesses related information and research needs. The five chapters of this brief highlight the essential qualities of the physical and cultural landscape within which present water issues have emerged; the philosophy of water management and the need for new strategies; major water issues identified and discussed under jurisdictional, water quantity, and water quality issues; and gaps in information to properly manage the Region's water resources with suggestions as to where additional efforts should be directed. The eight recommendations presented reflect perceived water management needs within the federal government. A corresponding transcript of hearings in Calgary addressing this submission is attached.

167 (073324)
ENVIRONMENT COMMITTEE OF THE ASSOCIATION OF CONSULTING ENGINEERS OF CANADA * ***Submissions to the Inquiry on Federal Water Policy by the Environment Committee of the Association of Consulting Engineers of Canada*** * In: Inquiry on Federal Water Policy : Ottawa, Ontario, December 3-10, 1984 * Dec 1984 * vp

Issues of particular concern to the Association of Consulting Engineers of Canada are presented with an endorsement of particular issues contained in the Canadian Water Resources Association brief. These issues include the role of the federal government, management structure, need for definition of resources, needs, problems and impacts, optimization of resources, enlisting public support, provision of sufficient funding, and establishment of guidelines. The corresponding transcript of the hearings in Ottawa addressing this submission is attached. It is stressed in the hearings that the federal government should provide leadership through cooperation with other levels of government and the private sector. A supplementary brief outlines three areas of basic concern with respect to engineering services being provided by the Prairie Farm Rehabilitation Administration and the effect this is having on the private engineering sector.

168 (073502)
ENVIRONMENT COUNCIL OF ALBERTA, SCIENCE ADVISORY COMMITTEE * ***A brief submitted to the Inquiry on Federal Water Policy by the Science Advisory Committee, Environment Council of Alberta*** * In: Inquiry on Federal Water Policy : Calgary, Alberta, October 9 & 10, 1984 * Oct 1984 * vp

Water issues of concern to members of the Science Advisory Committee, Environment Council of Alberta, related mainly to scientific research and technology development are discussed. Greater federal government support of research is recommended in four areas: improved water quality data base for Canada; greater ability to predict weather variability and climate change; increased development of demand management techniques and technologies; and better knowledge of wildlife habitat and aquatic ecosystems. The need for a cooperative and coordinated approach between federal, provincial and territorial governments in all aspects of water management is stressed. A corresponding transcript of hearings in Calgary addressing this submission is attached.

169 (073534)
ENVIRONMENTAL LAW CENTRE * ***Briefs of the Environmental Law Centre to the Inquiry on Federal Water Policy*** * In: Inquiry on Federal Water Policy : Edmonton, Alberta, October 12, 1984 * Sept 1984 * vp

A brief review of major concerns with the existing enforcement system of the Fisheries Act and other provincial environmental statutes in Alberta is presented in one of two submissions by the Environmental Law Centre. Specific areas of concern include jurisdiction and conflicting authority, monitoring and surveillance, and administrative diligence. Recommendations based on these concerns are identified. The second submission presents a case study to illustrate the legal uncertainties which arise when a project involving the use of water cuts across jurisdictional boundaries. The proposed hydroelectric dam on the Slave River is investigated with the focus on environmental consequences of the dam's construction. Each aspect of the development is analyzed to determine which level of government may have the jurisdiction to legislate with respect to the applicability of the legislation passed with an emphasis on the environmental provisions in the legislation. A corresponding transcript of hearings addressing these two submissions is attached.

170 (073341)
ENVIRONMENTAL MEDIATION INTERNATIONAL INC. * ***Alternative resolution techniques for water conflicts*** * In: Inquiry on Federal Water Policy : Ottawa, Ontario, December 3-10, 1984 * Nov 1984 * vp

The focus of this submission is to provide the Inquiry with some insight on conflict resolution and on the applicability of mediation techniques to the issues addressed by the Inquiry. Qualities of the mediation process attractive in disputes that have an environmental aspect, are outlined. Mediation has been used to settle disputes over the environmental aspects of areas like landfill siting, wildlife management, waste treatment facilities siting, and highway and harbour construction. Aspects of the environmental mediation process including the role of the mediator are explained. Two case studies - Northern Flood Agreement of Manitoba and the United States Grayrocks Dam controversy - where these techniques were used successfully to resolve a water dispute, are presented. Recommendations are offered to be considered for institution into federal water policy. Attached are a dispute settlement bibliography and the corresponding transcript of the hearings in Ottawa addressing this submission.

171 (073530)
ENVIRONMENTAL RESOURCE CENTRE * ***Submissions from the Environmental Resource Centre to the Inquiry on Federal Water Policy*** * In: Inquiry on Federal Water Policy : Edmonton, Alberta, October 12, 1984 * Oct 1984 * vp

Three documents are included in this submission by environmental organizations and conservation groups in Alberta. Exhibit 37A highlights and presents an overview of the major water management issues facing the prairies in terms of water supply and demand. Exhibit 37B focuses on river basin and water transfer. It discusses the proposed Oldman River Dam and the need to examine the demand for water before supply solutions are promoted. Research needs, need for a governmental environmental advocate in Alberta, and the question of interbasin transfer and diversion of water to the United States, including a series of leaked memos on the province's action plan for water management, are presented. Exhibit 37C discusses Indian water rights and specific concerns which the Indian Association of Alberta feels will impact on Indians' lives. These include the proposed Slave River Dam, pollution of the Athabasca River and Lake Athabasca tar sands plants in Fort McMurray, pollution of the Wapiti River, damages to the Peace River as a result of Bennett Dam operations, the hazardous waste disposal facility in Swan Hills and provincial water diversion schemes. A corresponding transcript of hearings addressing these submissions is attached.

172 (073358)
FARQUHARSON, K.G. * ***Brief of K.G. Farquharson to Inquiry on Federal Water Policy*** * In: Inquiry on Federal Water Policy : Vancouver, British Columbia, November 19-23, 1984 * Nov 1984 * vp

This personal submission focuses on issues which the presenter feels are necessary to bear in mind when formulating a national water policy. These include the downstream impacts of water storage projects, downstream benefits, water exports, and the Columbia River Treaty. The need for regulation at the federal level of water projects with transboundary effects, water export prohibition and concerted effort by Canada to tidy up loose ends of the Columbia River Treaty, including the adverse environmental impacts of water storage and

diversion, are recommended. Attached is a corresponding transcript of hearings in Vancouver addressing this submission. In particular, compensatory arrangements between jurisdictions that share a river system are explored.

173 (073310)
FEDERATION OF ASSOCIATIONS ON THE CANADIAN ENVIRONMENT • ***Federation of Associations on the Canadian Environment : presentation to the Inquiry on Federal Water Policy*** • In: Inquiry on Federal Water Policy : Ottawa, Ontario. December 3-10, 1984 • Dec 1984 • vp

This submission describes the size and scope of the water and water pollution control sector in Canada's economy and the current state of water as an industry and resource. One-page summaries of 18 issues, their background and recommendations form the main part of this brief. The issues are acid rain, water transfers, United Nations decade, disadvantaged Canadians, storm water collection, infrastructure deterioration, cold weather concerns, job creation, education and training of operators, bottled water, drinking water monitoring, point of use treatment, standards for private wells, national data, multiple levels of water use, health research, national legislation on drinking water, and uniform backflow prevention. The north-south connection provides a critical look at the existing North-American network for waterworks and water pollution control associations to illustrate the need for a strong Canadian association. The corresponding transcript of the hearings in Ottawa addressing this submission is attached.

174 (073354)
FEDERATION OF CANADIAN MUNICIPALITIES • ***Brief by the Federation of Canadian Municipalities to the Inquiry on Federal Water Policy*** • In: Inquiry on Federal Water Policy : Vancouver, British Columbia, November 19-23, 1984 • Nov 1984 • vp

This brief reports on the findings of a recent survey by the Federation of Canadian Municipalities on the physical condition and funding adequacy of Canada's urban infrastructure. The Inquiry on Federal Water Policy is asked to support the conclusions and recommendations of this report dealing with waterworks and sewage works. Eight recommendations are presented including federal policies to ensure the adequate functioning of these facilities. A corresponding transcript of hearings in Vancouver addressing this submission is attached.

175 (073352)
FIRST WATERCOUNT SYSTEMS LTD. • ***The water management process in critical watersheds : direct participation of water users and of parties affecting water systems*** • In: Inquiry on Federal Water Policy : Vancouver, British Columbia, November 19-23, 1984 • Nov 1984 • vp

This brief addresses direct participation of water users and affecters in critical watersheds to the overall management process. It also proposes policies which would promote across Canada the creation and operation of water resource management organizations (WRMOs) in critical watersheds to assist water users and affecters and industrial developments geared to profitable processing of solid wastes and effluents into marketable commodities in critical watersheds. These policies would consist of country-wide criteria to designate critical watersheds, incentives to the creation of WRMOs and to the development of waste processing industries, and establishment of a file on waste processing technologies and a support program to the development of waste processing industries. A corresponding transcript of hearings in Vancouver addressing this submission is attached.

176 (073367)
FISHERIES COUNCIL OF BRITISH COLUMBIA • ***A brief to the Inquiry on Federal Water Policy submitted by the Fisheries Council of British Columbia*** • In: Inquiry on Federal Water Policy : Vancouver, British Columbia, November 19-23, 1984 • Nov 1984 • vp

Commercial fishing and fisheries resources in British Columbia are closely linked to an effective water policy. Water supply including scarcity and flooding, effects on water quality by toxic chemicals, acid rain, general effluents, and conflicting demands, are examined. Federal/provincial jurisdictions and water research priorities are seen as two crucial issues in water management in British Columbia. A corresponding transcript of hearings in Vancouver addressing this submission is attached. Areas explored include the leadership role of the federal government in water resources management, fish enhancement opportunities on the Pacific Coast and the need for coordination between habitat management and fish management.

177 (073509)
FOND DU LAC INDIAN BAND • ***Brief of the Fond du Lac Indian Band to the Inquiry on Federal Water Policy*** • In: Inquiry on Federal Water Policy : Saskatoon, Saskatchewan, October 23, 1984 • Oct 1984 • vp

The Fond du Lac Indian Reserve Band insists on being a full partner in any review study or planning of resources in Alberta's Lake Athabasca Basin. Concern is specifically with the Slave River hydro project and its effects on Lake Athabasca's watershed basin. This Band was not consulted in the feasibility study and is concerned because it lives and depends on the basin. This brief forms part of the corresponding transcript of hearings in Saskatoon addressing this submission. Implications of raising the water level of Lake Athabasca and the effect of moving the mixing area eastward are explored.

178 (073335)
FRIENDS OF THE EARTH • ***Toxic chemical policy in Canada*** • In: Inquiry on Federal Water Policy : Ottawa, Ontario, December 3-10, 1984 • Dec 1984 • vp

Toxic chemical pollution, one of the water quality issues identified in the participation paper of the Inquiry on Federal Water Policy, is addressed. Two elements of an environmentally sound toxic chemicals policy are identified as prevention, which rejects the notion that nothing should be done about a substance until a hazard is proven, and the right of Canadians to know about the hazards posed by toxic chemicals to their health and environment. The track record of the federal Department of Environment in implementing these two principles is not good as the Department has overemphasized the assessment of existing scientific data at the expense of preventative action. Present toxic chemical policy is closed and remedial instead of open and preventative. To reduce the threat to water quality in Canada, this brief recommends that the Department of Environment show a stronger preventative approach to toxic chemicals and that proposed amendments to the new chemical notification system of the Environmental Contaminants Act be released immediately for public discussion and passage into law.

179 (073514)
GALE, J. * ***Submission by Dr. J. Gale to the Inquiry on Federal Water Policy*** * In: Inquiry on Federal Water Policy : St John's, Newfoundland, September 24, 1984 * 1984? * vp

This personal submission forms part of the transcript of hearings in St John's, Newfoundland. The focus is on groundwater quality and groundwater potential in the Atlantic Region, particularly Newfoundland. Conclusions reached are that groundwater research must be integrated across technical and scientific lines; a sound groundwater data base needs to be established in Newfoundland; research must be a federal/provincial/university partnership; and physical, chemical and isotopic characteristics of ground water must be understood to know the risk to ground water. Areas explored in the transcript are the nature of rock wells and available information, federal involvement and mechanisms of partnership and the politicizing of research as evidenced by the Environment 2000 grant system.

180 (073400)
GALLOP, R.A. * ***Brief to the Inquiry on Federal Water Policy by Professor R.A. Gallop*** * In: Inquiry on Federal Water Policy : Winnipeg, Manitoba, October 24, 1984 * Oct 1984 * vp

Present concerns of water resources management are detailed in this submission. These include need to improve efficiency and versatility of present systems; the lack of emphasis on physical chemistry, which is important in water use matters; chemical engineering approach must replace civil engineering ideas in water management; greater efficiency of water and sewage systems; greater use of water conservation methods; and significant reduction in sources and better water management. A case study of the Red River Basin is presented to show water quality/water quantity management problems with remedial measures including improved wastewater treatment process, water recycling, reclamation and reuse. A corresponding transcript of hearings in Winnipeg addressing this submission is attached. The main area explored is water misuse in industry.

181 (073355)
GITKSAN-WET'SUWET'EN TRIBAL COUNCIL * ***Gitksan-Wet'suwet'en Tribal Council brief to Inquiry on Federal Water Policy*** * In: Inquiry on Federal Water Policy : Vancouver, British Columbia, November 19-23, 1984 * Nov 1984 * vp

The legislative history of the Gitksan-Wet'suwet'en land claim in British Columbia, the Indian economy prior to 1950 and aspects of the Tribal Council's way of life are described. The strong need to institute an alternative to the present federal fisheries management policies on the upper Skeena and the proposal by Alcan to divert part of the headwaters of the Bulkley River out of the territories under the Kemano Expansion Plan have promoted the Tribal Council to focus on water policy. Control is critical as the province claims ownership of the water and the federal government claims jurisdiction over the fisheries. Two main recommendations are that the Government of Canada incorporate the principle and reality of aboriginal title into its water policies and other resources policies within its jurisdiction, and that a water management system within the Gitksan-Wet'suwet'en territories be based on the principles of local control, natural law and consensus decision-making. A corresponding transcript of hearings in Vancouver addressing this submission is attached. Areas explored are creation of a local water board, Indian rights, and water policy.

182 (073574)
GOERING, J.W.L. * ***Brief of Mr. J.W.L. Goering to the Inquiry on Federal Water Policy*** * In: Inquiry on Federal Water Policy : Toronto, Ontario, October 31st to November 2, 1984 * Oct 1984 * vp

This personal submission concerns the need for a change in attitudes to enable people to live more in harmony with their environment and the importance of education in achieving this goal. The ecosystem approach to dealing with water, which is only part of the earth's components, is discussed. The importance of environmental education, incentives and/or disincentives to persuade companies to act responsibly towards the environment, population growth and movement towards a substainable society in water protection and conservation are outlined. Some comments on saving water are presented in the areas of city water intakes, storm sewers, sud savers, demand management, water export and municipal water rates. A corresponding transcript of hearings in Toronto addressing this submission is attached. Areas explored are water conservation and public education.

183 (073527)
GOLDSMITH, B. * ***Paper presented to the Inquiry on Federal Water Policy by Bernice Goldsmith*** * In: Inquiry on Federal Water Policy : Montreal, Quebec, November 5-6, 1984 * Nov 1984 * vp

This personal submission urges immediate and concerted effort to stop pollution instead of only cleaning up; provide better environmental management with early and better assessments of impact prior to taking action; institute reevaluation of the Environmental Assessment Review Process; encourage completion of Quebec's sewage treatment facilities; stop the proposed Project Archipel water management scheme for the Island of Montreal; give more responsibility to Environment Canada for water resources management; institute a household and industry water audit project to encourage better use of water; and encourage more research which addresses the utilization of information by decision-making communities. Seven specific recommendations are presented. A corresponding transcript of the hearings in Montreal addressing this submission is attached. Areas explored are more public participation in the environmental assessment process and federal/provincial relations in water management.

184 (073359)
GORDON, D. * ***Wild & scenic rivers as a management tool in Canada*** * In: Inquiry on Federal Water Policy : Vancouver, British Columbia, November 19-23, 1984 * Nov 1984 * vp

This submission recommends that the Government of Canada seriously consider wild and scenic rivers legislation as a water resources management tool. The rationale is that it would provide a vehicle for rational development of river systems while ensuring that outstanding attributes are protected. If the Canadian government cannot be sure that existing management tools are sufficient now and in the future to provide an equitable balance between developmental and preservation ethics, then additional scientific inquiry and research is required. A brief history of the United States National Wild and Scenic Rivers Act and its effect is presented. A corresponding transcript of the hearings in Vancouver addressing this submission is attached. Areas explored are the federal government's Heritage Rivers Program and the United States Wild and Scenic Rivers Program.

185 (073428)
GOVERNMENT OF NOVA SCOTIA, DEPARTMENT OF THE ENVIRONMENT * ***Submission to the Inquiry on Federal Water Policy by the Nova Scotia Department of the Environment*** * In: Inquiry on Federal Water Policy : Halifax, Nova Scotia, September 18 and 19, 1984 * Sept 1984 * vp

This submission is organized into three sections. Section I is a summary of recommendations which the Nova Scotia Department of the Environment believes should be reflected in federal water policy. Section II identifies water management issues in Nova Scotia and specific informational or managerial requirements for addressing these issues. Section III provides the rationale for the various recommendations that are made to the Inquiry along with a suggestion to adopt four water management principles. Some of the recommendations include formal mechanisms for federal/provincial policy consultation and coordination in areas of shared jurisdiction; federal policies or programs designed to assist provinces in managing water resources on a geographical basis, to support water management for multiple uses and to take into account regional interests, priorities and expertise; and greater emphasis on interpretive research studies. A corresponding transcript of hearings in Halifax addressing this submission is attached. Areas explored are federal/provincial cooperation and national water quality standards.

186 (073516)
GOVERNMENT OF THE NORTHWEST TERRITORIES * ***Government of the Northwest Territories brief to Federal Inquiry on Water Resources*** * In: Inquiry on Federal Water Policy : Yellowknife, Northwest Territories, October 16, 1984 * 1984? * vp

This brief suggests two changes to the federal government's role in water management in the Northwest Territories. These are a phased transfer of responsibility for all aspects of water resources management that are normally provincial responsibilities to the Government of the Northwest Territories and strengthening the federal role in mediating and arbitrating interjurisdictional aspects of water use allocation. The brief is organized into four sections: identification of water resource issues; examination of existing water resource regulatory regimes in the Northwest Territories; presentation of position of Northwest Territories government on water resource management; and recommendations to the Inquiry on how it may assist the Government of the Northwest Territories in achieving its goals. A corresponding transcript of the hearings in Yellowknife addressing this submission is attached. Areas explored are the present arrangement of water administration in the Northwest Territories and the future role of the federal government in interjurisdictional matters.

187 (073515)
GRAND CANAL COMPANY LIMITED * ***The Great Recycling and Northern Development (GRAND) Canal : a proposal to create a new dike-enclosed, sea level freshwater lake in James Bay*** * In: Inquiry on Federal Water Policy : St John's, Newfoundland, September 24, 1984 * Sept 1984 * vp

The GRAND (Great Recycling and Northern Development) Canal Concept proposes five environmentally protective and interdependent water resource opportunities providing direct benefits to Canada and indirectly to the United States. The GRAND Canal proposal is to create a new, dike-enclosed sea level freshwater lake in James Bay. This submission outlines the five major benefits and briefly considers the California experience, costs and revenues, social and environmental factors, the present Canadian and legal position of diversions, recycling and its basic difference from diversions, and the need for a new Canada-United States water management agreement. The GRAND Canada Company Limited has been formed to develop, manage and operate the proposed water recycling enterprise under the regulation of the public

authorities in those regions which will participate in its benefits. A corresponding transcript of hearings in St John's addressing this submission is attached.

188 (073430)
GRANTHAM, D.A. * ***Drinking water quality and health: federal/provincial responsibilities*** * In: Inquiry on Federal Water Policy : Halifax, Nova Scotia, September 18 and 19, 1984 * 1984 * vp

The presenter's personal involvement in two investigations in Nova Scotia on the natural occurrence and potential health effects of arsenic and uranium in drinking water supplies has led to concerns about federal involvement in Canadian drinking water quality guidelines. Based on his experience, the following recommendations are made: recognition by the federal government that a water quality program being undertaken in one province may have national significance and it could then act in a coordinating role; funding mechanism to support in any province water quality research which could also have national significance; and implementation at the federal level of a more effective effort to relate concentrations of potential water contaminants set down in guidelines to health effects. The respective roles of the provincial and federal jurisdictions with respect to drinking water quality are weighed. This submission forms part of the corresponding transcript of hearings in Halifax addressing this submission.

189 (073382)
GRAYSTOKES MONITORING COMMITTEE * ***Submission by Graystokes Monitoring Committee to the Inquiry on Federal Water Policy*** * In: Inquiry on Federal Water Policy : Kelowna, British Columbia, November 28, 1984 * Nov 1984 * vp

The task of the Graystokes Monitoring Committee to ensure that the Graystokes area, British Columbia, can accommodate forest harvesting, water and recreational use without detrimental effects to any user is described. This brief forms part of the corresponding transcript of hearings in Kelowna. Areas addressed in the transcript are the composition and authority of the Graystokes Monitoring Committee, watershed protection, and public channels of communication with provincial authorities.

190 (073320)
GREAT LAKES INSTITUTE * ***Submission to Inquiry on Federal Water Policy from the Great Lakes Institute*** * In: Inquiry on Federal Water Policy : Ottawa, Ontario, December 3-10, 1984 * Dec 1984 * vp

This brief proposes that the Inquiry on Federal Water Policy recommends to the federal government that a Lake Grant program similar to the United States Sea Grant College Program be initiated in Canada to support university-based Great Lakes research and to educate future Canadian Great Lakes experts. The assurance of continued funding to enable the Great Lakes Institute to carry on its toxic contaminant work is essential. A transcript of the hearings in Ottawa gives a background of the Institute, advantages of a Lake Grant program and stresses the role of universities in water-related research. An additional paper on the economic effects of the United States Sea Grant College Program is also attached.

191 (073321)
GREAT LAKES UNITED * ***The international issues and problems affecting the Great Lakes and the St. Lawrence River : Great Lakes United's brief to the Canadian Inquiry on Federal Water Policy*** * In: Inquiry on Federal Water Policy : Ottawa, Ontario, December 3-10, 1984 * Nov 1984 * vp

The key issues that are or will be affecting the Great Lakes/St Lawrence River are discussed. These include water quality and the Great Lakes Water Quality Agreement; toxic substances, including fish cancer and contamination and budget cuts in Canada's environmental toxicology program; commercial shipping including seaway expansion; diversions, including water exports and consumptive uses; atmospheric deposition; and fish and wildlife habitats, including wetlands preservation. This brief stresses that neither Canada nor the United States owns the Great Lakes/St Lawrence River and that the adoption of a clearer continental environmental ethic by the two countries is needed to ensure environmental peace. Recommendations are presented to promote binational conservation and protection of the Great Lakes. The corresponding transcript of the hearings in Ottawa addressing this submission is attached. The hearings focused on the place of the province of Quebec in the present Great Lakes Agreement.

192 (073376)
GREATER VERNON AND DISTRICT ENVIRONMENTAL COMMITTEE * ***Greater Vernon and District Environmental Committee submission to the Federal Inquiry on Water Policy*** * In: Inquiry on Federal Water Policy : Kelowna, British Columbia, November 28, 1984 * 1984? * vp

A cost-effective land application alternative is proposed for ultimate disposal of effluent in Vernon, British Columbia. The city has proposed to construct a new sewage treatment plant and to discharge sewage effluent into Okanagan Lake constituting a significant threat to public health and recreation. This submission requests that authorization to carry out an expensive waste management study be delayed until this proposal is thoroughly examined. Copies of several reports by the Greater Vernon and District Environmental Committee, legal action taken, results of independent water testing, and letters to federal and provincial government authorities are included with this brief. A corresponding transcript of hearings in Kelowna addressing this submission is attached. Areas explored are the role of the federal government in determining acceptable water quality standards or guidelines, susceptibility of the Okanagan Lake system to any sources of pollution, usefulness of effluent irrigation programs, and alleged violation by the provincial government of its own pollution laws.

193 (073363)
GREEN PARTY OF BRITISH COLUMBIA • ***Submission of the Green Party of British Columbia to the Federal Water Policy Commission*** • In: Inquiry on Federal Water Policy : Vancouver, British Columbia, November 19-23, 1984 • Nov 1984 • vp

Eight recommendations are put forward addressing the main concerns of the Green Party concerning water protection in British Columbia. Concerns discussed were need to adopt the conserver society ethic to value and manage water resources wisely; hydroelectric development - energy conservation and energy growth; long-term hydrological effects of the rapid deforestation of British Columbia's interior; and habitat protection. The recommendations primarily oppose international water basin transfer, water quality deterioration in the salmon spawning Fraser River, hydro dam construction in the Mackenzie River watershed, acid rain, and the Kemano II project. A corresponding transcript of the hearings in Vancouver addressing this submission is attached.

194 (073507)
HARRISON, D. • ***Inquiry on Federal Water Policy : personal brief submitted by Derrick Harrison*** • In: Inquiry on Federal Water Policy : Calgary, Alberta, October 9 & 10, 1984 • Oct 1984 • vp

This personal submission comments on the water and sewage industry in Canada, which is in need of promoting public information and awareness on the importance of protecting the national investment in water and sewer systems, increased research activity of common interest to the utilities, better training and certification of operators, and supporting travel opportunities for participation by experts in the private sector. A corresponding transcript of hearings in Calgary addressing this submission is attached.

195 (073409)
HOWARD, R. • ***Submission of Richard Howard to the Inquiry on Federal Water Policy*** • In: Inquiry on Federal Water Policy : Winnipeg, Manitoba, October 24, 1984 • Oct 1984 • vp

This personal submission details how water should be acknowledged not only as a commodity resource but as environment. In addition to the public consultation process established by the Inquiry on Federal Water Policy, it is felt that as part of the decision-making process, a concerted commitment to an educational program available to all degrees of expertise and at all levels of society is needed. A corresponding transcript of hearings in Winnipeg addressing this submission is attached. Areas explored are public education in water management matters and joint public/private participation to solve water problems.

196 (073556)
HUNTER, R. • ***Brief of Mr. Ron Hunter to the Inquiry on Federal Water Policy*** • In: Inquiry on Federal Water Policy : Toronto, Ontario, October 31st to November 2, 1984 • 1984 • vp

Charges that Water Survey of Canada altered records so that a flood line mapping study would allow Parks Canada and Ontario Ministry of Natural Resources freedom of operation with no fear of reprisal are laid in this submission. It is recommended that Environment Canada adopt a policy of openness with respect to its recorded data and of no revisions on records over 30 years old or without a full inquiry and consideration for all attributing anomalies in the system; Environment Canada initiate an intergovernmental committee to define and create a realistic set of flood line guidelines; that federal policy calling on users to pay the cost of using water be reaffirmed; and Environment Canada adopt a policy of responsibility to minimize flooding. A corresponding transcript of hearings in Toronto addressing this submission is attached. Areas explored are flooding on the Severn River and the user-pay concept.

197 (073334)
HUNTER, R.B. • ***Second report to the Inquiry on Federal Water Policy submitted by R.B. Hunter*** • In: Inquiry on Federal Water Policy : Ottawa, Ontario, December 3-10, 1984 • Dec 1984 • vp

This personal supplementary submission outlines two areas which the Inquiry must address: airborne coal pollutants and pollutants from Ontario Hydro's thermal power generation. Hydraulic power generation can reduce thermal generating needs with the effect being cleaner precipitation and significantly lower cleanup costs. Until there is clean precipitation, there cannot be clean water in lakes and rivers. The corresponding transcript of the hearings on this submission is attached. Emphasis is on the need for revisions to historical data to take account of today's standards and priorities and the user-pay theory.

198 (073392)
INDIAN AFFAIRS AND NORTHERN DEVELOPMENT, YUKON REGION • ***Indian Affairs and Northern Development, Yukon Region : presentation to Inquiry on Federal Water Policy*** • In: Inquiry on Federal Water Policy : Whitehorse, Yukon, October 15, 1984 • Oct 1984 • vp

This submission representing the views of the Yukon Region on the federal government's Northern Affairs Program describes the setting for management in the Yukon including the legislation and institutions, water supply and demand, water quantity and water quality. Four major water issues are discussed: water use and the many different users that are in competition for the water resource; effects of large-scale hydroelectric development; effects of interbasin transfer; and, interjurisdictional responsibility and need for cooperation. A corresponding transcript of the hearings in Whitehorse addressing this submission is attached. Areas explored are interbasin transfer and the need for cooperation, administration of water licenses, toxicity of mine tailings, and administration and regulation on interjurisdictional rivers.

199 (073343)
INDIAN AND NORTHERN AFFAIRS CANADA • ***Submission paper to the Inquiry on Federal Water Policy submitted by Indian and Northern Affairs Canada*** = Présentation soumise à la Commission d'enquête sur la politique fédérale relative aux eaux présentée par Affaires indiennes et du Nord Canada • In: Inquiry on Federal Water Policy : Ottawa, Ontario, December 3-10, 1984 • Indian and Northern Affairs Canada, Ottawa, Ont • 1984? • vp

This submission stresses that a multifaceted federal water policy must consider the potential uses of water and its capability to meet regional needs and aspirations as well as to contribute to regional and national goals. It must recognize the legitimate claims of northern native people and be flexible enough to respond to them. The submission is divided into two parts. Part I discusses the interests of Indian and Inuit affairs, the question of title and comprehensive claims, and management issues such as dealing with water supply, conflicting demands, and water quality. Part II examines northern affairs interests (Yukon and Northwest Territories), resource issues and management principles and initiatives. These include interjurisdictional water resource management, administrative/legislative issues, and integrated northern water planning. The corresponding transcript of the hearings in Ottawa addressing this submission is attached.

200 (073521)
INDIAN AND NORTHERN AFFAIRS CANADA, NORTHERN AFFAIRS PROGRAM • ***Northern water management issues: a regional perspective*** • In: Inquiry on Federal Water Policy : Yellowknife, Northwest Territories, October 16, 1984 • Oct 1984 • vp

Preserving future water resources is dependent on a clearer definition of water management responsibilities and the appropriate management options to address them. A background on northern water management is presented to underline the need to establish priorities, policies and objectives for long-term northern water use. A discussion of northern water resource issues includes the quality and effectiveness of northern water resources planning, the establishment of acceptable water quality objectives for specific water management areas, transboundary water management agreements, priority for use of water, abandonment and restoration of development projects, need to revise the Northern Inland Waters Act and regulations, and enforcement of the Act by the Northern Affairs Program. Eight recommendations are presented on the need for close alignment between water use and land planning, cooperation between federal/provincial/territorial governments on transboundary water management issues, and water quality and environmental quality protection. A corresponding transcript of hearings in Yellowknife addressing this submission is attached.

201 (073426)
Inquiry on Federal Water Policy : background information • In: Inquiry on Federal Water Policy : Halifax, Nova Scotia, September 18 and 19, 1984 • Apr 1984 • vp

This document brings together the material made available to the media when the Inquiry on Federal Water Policy was appointed on January 26, 1984. These are: a press release from the Minister, Environment Canada; speech/speaking notes for Charles Caccia, Minister, Environment Canada; media backgrounder on water issues; biographical note on the Chairman, Peter H. Pearse; and terms of reference of the Inquiry. A brief transcript of hearings in Halifax addressing this package is attached.

202 (073383)
INTERNATIONAL WOODWORKERS OF AMERICA • ***Submission of the International Woodworkers of America to the Inquiry on Federal Water Policy*** • In: Inquiry on Federal Water Policy : Kelowna, British Columbia, November 28, 1984 • 1984? • vp

The International Woodworkers of America is seriously concerned about the lumber industry's use of chlorophenates and chlorophenols and their impact on health and the environment. Over 3 486 600 gallons of contaminated leachate from runoff of rainfall on treated Wonak lumber has entered the Fraser River each year for the last three years. Toxic contaminants, notably dioxins, are also released into the air when sawmills burn the chlorophenate-contaminated material in their burners. Two contaminants present in most formulations of tetrachlorophenate and tetrachlorophenol present risk of cancer and fetotoxic effects.

203 (073385)
ISLANDS TRUST, MINISTRY OF MUNICIPAL AFFAIRS • ***The waters of the Trust area*** • In: Inquiry on Federal Water Policy : Victoria, British Columbia, November 26, 1984 • Nov 1984 • vp

This submission describes the function of the Islands Trust and the area within which it has jurisdiction. The Trust is the agency responsible for land use planning of the islands in the southern half of the Strait of Georgia with preservation and protection of the environment being its special focus. Increasing pollution, well interference, saltwater intrusion and mineralization are degrading current supplies. Development pressure from adjacent centres of population are threatening the quantity, the quality, and future supplies. Three major requirements for effective action are identified: research to improve the monitoring of quality and quantity of freshwater supplies; regulations to improve and control use and allocation of fresh and marine environments; and educational and positive incentive programs to increase general awareness of the seriousness of the water crisis. A corresponding transcript of hearings in Victoria addressing this submission is attached.

204 (073523)
JAMES BAY CREES • ***Presentation of the James Bay Crees to the Inquiry on Federal Water Policy*** • In: Inquiry on Federal Water Policy : Montreal, Quebec, November 5-6, 1984 • Oct 1984 • vp

The origin of the James Bay and Northern Quebec Agreement, which enabled the Cree and Inuit people to preserve their way of life and retain their aboriginal rights, is explained in this submission. Issues are detailed and recommendations presented. These include interjurisdictional difficulty in all aspects of water management; joint federal-provincial responsibility for boundary waters; assessment of impact of major hydroelectric developments and federal responsibility for aboriginal and Indian rights; environmental effects to water systems in Hudson Bay and James Bay; federal responsibility for water treatment; role of the federal government in water research; specific federal responsibilities in hydroelectric power development; and federal legislation relevant to water management. A corresponding transcript of hearings in Montreal addressing this submission is attached. The main focus is on the federal government's responsibility to preserve the interest of the Crees and their environment.

205 (073386)
KEENAN, C.J. • ***Brief of Charles J. Keenan to the Inquiry on Federal Water Policy*** • In: Inquiry on Federal Water Policy : Victoria, British Columbia, November 26, 1984 • Nov 1984 • vp

This submission in letter form presents a strong objection to any intrusion of federal agencies into areas of provincial jurisdiction as this represents a waste of tax dollars for worthless results. This is documented in the presenter's book Environmental Anarchy. The need for an inquiry into water policy for the purpose of determining federal responsibilities and the environmental doomsday theme of the inquiry are questioned. A corresponding transcript of hearings in Victoria addressing this submission is attached. Areas explored are the validity of the presenter's position on environmentalists, encroachment by the federal government into areas of provincial jurisdiction and the effects of waste disposal methods in British Columbia.

206 (073559)
LAKEHEAD REGION CONSERVATION AUTHORITY • ***Brief of the Lakehead Region Conservation Authority to the Federal Inquiry on Water Policy*** • In: Inquiry on Federal Water Policy : Toronto, Ontario, October 31st to November 2, 1984 • 1984 • vp

The activities of the Ontario conservation authorities are detailed with emphasis on the Lakehead Region Conservation Authority in the areas of flood plain management, erosion control, land use planning, urban/rural drainage, recharge/source areas and wetlands protection. The establishment of conservation authorities in Ontario with a major objective of water management on a watershed basis is seen as a method of dealing with water issues at the grass roots level. It is recommended that the topic of wetlands must be addressed in a federal water policy and that the federal water policy should consider the conservation authorities' technical expertise as a valuable resource that should be developed within existing frameworks with expansion of the roles of agencies already in place. A corresponding transcript of hearings in Toronto addressing this submission is attached. Focus is on the mandate and activities of conservation authorities.

207 (073554)
LAMBTON INDUSTRIAL SOCIETY • ***Submission to Inquiry on Federal Water Policy : Lambton Industrial Society*** • In: Inquiry on Federal Water Policy : Toronto, Ontario, October 31st to November 2, 1984 • 26 Oct 1984 • vp

The Lambton Industrial Society endorses the principle of internal responsibility for pollution by government, industry and municipalities as well as a balanced approach to point and non-point source contamination. It advocates regulations or guidelines on a phased-in basis which show a degree of uniformity between the levels of government and a built-in procedure which requires reevaluation of the need for a specific regulation or guideline every 3 to 5 years. It further stresses the need for a clear statement of purpose by federal and provincial governments to restore confidence in Canada's commitment to a rational best science evaluation process for water quality improvement. A corresponding transcript of hearings in Toronto addressing this submission is attached.

208 (073365)
LIFEFORCE FOUNDATION • ***Presentation for marine wildlife sanctuaries to Inquiry on Federal Water Policy*** • In: Inquiry on Federal Water Policy : Vancouver, British Columbia, November 19-23, 1984 • Nov 1984 • vp

This submission stresses that the federal government must take the first steps towards protecting marine life and the water environment. It proposes that federal waters be designated as marine sanctuaries prohibiting the capture of marine life; commercial fishing in the sanctuaries be allowed in designated areas at certain times of the year; and sport fishing be banned in federal waters. It is hoped that these sanctuaries would provide a non-violent alternative to aquaria and result in increased tourism. A corresponding transcript of the hearings in Vancouver addressing this submission is attached.

209 (073346)
LILLOOET TRIBAL COUNCIL • ***Submission to Federal Water Inquiry by Lillooet Tribal Council*** • In: Inquiry on Federal Water Policy : Vancouver, British Columbia, November 19-23, 1984 • Nov 1984 • vp

Concerns about water use, water control and water care in British Columbia are expressed. This submission specifically addresses water for export, water use for power by BC Hydro, Alcan and the Bridge River Complex, water jurisdictions, present administrative jurisdictions of the Lillooet Tribal Council, fish habitat

in the Fraser River and effects of present water policy on fish and birds. Recommendations include water resources development recognizing title to Lillooet tribal territory and its water resources; clarification of present federal/provincial jurisdictions; further resource extraction to be dependent on complete planning processes; inquiry into the ecological effects of Fraser River effluents on fish; and development and implementation of a hazardous waste management strategy. Attached is a proposal for such a strategy by the Hazardous Waste Management Coalition of British Columbia.

210 (073350)
LOWER MAINLAND GROUP, SIERRA CLUB OF WESTERN CANADA * ***A submission to the Inquiry on Federal Water Policy prepared by the Lower Mainland Group, the Sierra Club of Western Canada*** * In: Inquiry on Federal Water Policy : Vancouver, British Columbia, November 19-23, 1984 * Nov 1984 * vp

The need for a national water policy to cope with issues like water export, which transcend provincial jurisdiction, is seen as the vital gap in the administration of Canadian water resources. The Sierra Club feels that the federal government has a role to play in water export issues and proposes a three-step application procedure for water export projects. These are issuance of a conditional water licence by the appropriate provincial authority; formal application to the existing National Energy Board (NEB) to consider the project proposal; and appeal to the International Joint Commission on NEB decisions. Although the Club is not in favour of transboundary water export, it sees the proposal as filling a gap in the current legislative framework for water management in Canada. A corresponding transcript of hearings in Vancouver addressing this submission is attached.

211 (073531)
MACKAY, W.C.; PREPAS, E.E. * ***Brief to Inquiry on Federal Water Policy by Drs. W.C. Mackay and E.E. Prepas*** * In: Inquiry on Federal Water Policy : Edmonton, Alberta, October 12, 1984 * Oct 1984 * vp

This personal submission addresses the question of funding for applied aquatic research in western Canada. It is felt that the federal government must continue to be the major supporter of aquatic research in Canada, and that funding is needed to address applied problems common to the three Prairie provinces. The unique problems concerning fresh water in the boreal plains must be specifically addressed when funding applied aquatic research. Basic data are lacking to bring water management for the boreal plains to the standards available in central and eastern Canada. A corresponding transcript of hearings in Edmonton addressing this submission is attached. Areas explored are the effects of wind speed on lakes, differences between waters of the boreal plains and the Precambrian Shield, and federal responsibility for water research in western Canada.

212 (073399)
MANITOBA DEPARTMENT OF ENVIRONMENT AND WORKPLACE SAFETY AND HEALTH * ***A brief to the Inquiry on Federal Water Policy presented by the Manitoba Department of Environment and Workplace Safety and Health*** * In: Inquiry on Federal Water Policy : Winnipeg, Manitoba, October 24, 1984 * Oct 1984 * vp

A federal water policy should address the issues of eutrophication, potable water supply, toxic chemicals, long-range transport of air pollutants, mining effluents and transboundary water quality. Eleven propositions are presented in this submission: water management is a provincial responsibility; Canada must enforce its water resource management legislation; water quality must be considered coequal with quantity; Canada should assume the lead role in interprovincial water quality matters; water quality must be a component of federal water-related funding; Canada should address the question of water quality-related funding mechanisms; Canada should ensure that federal funds are supportive of provincial initiatives; water must be managed by watershed; Canada must continue to have jurisdiction for international water issues; and Canada should play the lead role in water-related research and education. A corresponding transcript of hearings in Winnipeg addressing this submission is attached. The main area explored is federal/provincial responsibility in water management.

213 (073398)
MANITOBA ENVIRONMENTAL COUNCIL * ***Brief to the Inquiry on Federal Water Policy from Manitoba Environmental Council*** * In: Inquiry on Federal Water Policy : Winnipeg, Manitoba, October 24, 1984 * Oct 1984 * vp

The position of the Manitoba Environmental Council relating to current water issues in Manitoba, including effects on water systems of energy production, agricultural activities, and waste disposal, is presented. Eight appendices detail these concerns. It is felt that more effort should be made to predict environmental impacts of proposed projects so that more complete cost-benefit analysis can take place in the planning stage and various alternatives weighed. Development must proceed from an environmentally informed base with the minimum environmental disturbance possible and with adequate environmental monitoring before, during and after the development. A corresponding transcript of hearings in Winnipeg addressing this submission is attached. The main area explored is public involvement in the policy development process.

214 (073408)
MANITOBA WATER COMMISSION * ***Submission by Manitoba Water Commission to the Inquiry on Federal Water Policy*** * In: Inquiry on Federal Water Policy : Winnipeg, Manitoba, October 24, 1984 * Sept 1984 * vp

Two concerns in defining a national water policy are addressed: water should be identified as a separate

resource, either in the existing statutes or in any new constitution, and water policy should be managed on a drainage basin scale with a clearly defined hydrologic hierarchy of drainage basins. Important considerations to take into account are public perception of the myth of superabundance of water, availability of few water substitutes, and exaggeration of regional disparities of water by climate change, population shift and lack of understanding of the problem. Strong opposition is voiced to any shift from the present riparian system to any form of appropriative doctrine, uncontrolled diversion of northern waters to southern regions, and water transfer to the United States. A corresponding transcript of hearings in Winnipeg addressing this submission is attached. Areas explored are water pricing, federal/provincial relations in water management and crisis management.

215 (073498)
MAREAN, J.H. * ***The use of schools in the development and promotion of water policy*** * In: Inquiry on Federal Water Policy : Calgary, Alberta, October 9 & 10, 1984 * 1984? * vp

This personal submission states that children and youth should be involved through the schools in any program which may come out of the Inquiry on Federal Water Policy. The hope is that some national effort will provide ways for this segment of society to be represented in the gathering of information and the formulation of solutions to water management problems. A discussion of schools today, students as data gatherers, and application of creating and distributing teaching resource materials to the study of water in Canada is presented. A corresponding transcript of hearings in Calgary addressing this submission is attached. Areas explored are ways in which the federal government could elevate the concern about water and its uses in the elementary and secondary school level and increasing public awareness.

216 (073564)
METROPOLITAN TORONTO WATER POLLUTION COMMITTEE * ***Inquiry on Federal Water Policy : brief by Metropolitan Toronto Water Pollution Committee*** * In: Inquiry on Federal Water Policy : Toronto, Ontario, October 31st to November 2, 1984 * 1984 * vp

Causes of water quality degradation in Lake Ontario and its effect on the city of Toronto are examined in this submission. The three major causes are storm sewers discharging very close to the shore in Lake Ontario, deposition of silt and sediment along the banks of the lake, and the huge gull population of Toronto. Closing of the city's beaches in 1983 led to public outrage and the subsequent formation of the Metropolitan Toronto Water Pollution Committee. Activities by this Committee to clean up the beaches are detailed. A long-term program including extending sewers, dredging recreational waters, controlling the bird population, eliminating industrial pollution and separating the sanitary sewer systems would require $66.4 million. A corresponding transcript of hearings in Toronto addressing this submission is attached. Areas explored are federal government funding to municipalities for water pollution control and the Canada/United States position on Great Lakes water quality management.

217 (F13125)
MINISTÈRE DE L'ENVIRONNEMENT * ***Enjeux et options : mémoire du ministère de l'Environnement à l'audience nationale du Comité d'enquête sur la politique fédérale relative aux eaux*** = Issues and options : submission by the Department of the Environment to the national hearing of the Inquiry on Federal Water Policy * In: Transcript of hearings : Inquiry on Federal Water Policy, Ottawa, Ontario, December 3-10, 1984 * déc 1984 * 64p

Ce mémoire aborde les questions de quantité et de qualité de l'eau, la gestion des eaux ainsi que les domaines de compétence juridique. Les questions de quantité traitent de l'accessibilité des ressources (eaux souterraines et dérivation de cours d'eau) et des dangers naturels (inondations et sécheresses). Les questions de qualité envisagent l'état des ressources, le problème des pluies acides, des substances toxiques ainsi que celui des eaux usées. Ensuite, les différentes utilisations de l'eau sont décrites (irrigation, consommation et prévision des demandes en eau), et la gestion de la demande est expliquée. La planification régionale et la mise en oeuvre des recommandations des planificateurs font l'objet du chapitre suivant. Pour terminer, les questions intergouvernementales, ainsi que la coordination et l'organisation des activités sont mentionnées.

218 (F13127)
MINISTÈRE DES PÊCHES ET DES OCÉANS * ***Rapport présenté au Comité d'enquête sur la politique fédérale relative aux eaux*** = Submission to the Inquiry on Federal Water Policy * In: Transcript of hearings : Inquiry on Federal Water Policy, Ottawa, Ontario, December 3-10, 1984 * 06 déc 1984 * pd

Ce document expose la situation du milieu aquatique au Canada, et les auteurs émettent une série de recommandations concernant les différents points traités. Le ministère des Pêches et des Océans présente d'abord ses objectifs et son mandat. Ensuite, l'importance économique de la pêche en eau douce est mise en évidence. Les questions traitées dans ce document relèvent principalement de la qualité de l'eau (contamination du poisson et de son habitat, pluies acides, limon et autres substances toxiques) et de la quantité d'eau disponible (modification du niveau d'eau et de l'écoulement des eaux). Des mesures administratives sont proposées, ainsi qu'une politique pour la gestion de l'habitat du poisson. En conclusion, les auteurs insistent sur l'importance des mesures correctives aux lacunes de la politique de gestion des eaux. Enfin, le plan d'action du ministère est présenté; celui-ci vise à protéger l'état du poisson et de son habitat.

219 (073419)
MINISTRY OF COMMUNITY AND CULTURAL AFFAIRS * ***A brief submitted by the Minister of Community and Cultural Affairs, Prince Edward Island*** * In: Inquiry on Federal Water Policy : Charlottetown, Prince Edward Island, September 26, 1984 * Sept 1984 * vp

Water resource issues in Prince Edward Island (past, present and future) are described focusing on the level of success of contributions by federal water agencies. Issues discussed are groundwater supply and quality, surface water, agricultural activities, petroleum storage and handling, waste disposal, drinking water quality standards and legislation, nutrient enrichment and eutrophication, water and economic development, water supply and wastewater treatment infrastructure, inland fish habitat, water research, acid rain, greenhouse effect, aquaculture leases, and infilling of estuarine fringes. Development of management programs that are more reflective of the overall impact man is having on water resources is imperative. Included are recommendations on the nature and magnitude of federal government involvement in dealing with present and future issues. A corresponding transcript of hearings in Charlottetown addressing this submission is attached.

220 (073524)
MOHAWK COUNCIL OF KAHNAWAKE * ***Brief of the Mohawk Council of Kahnawake to the Inquiry on Federal Water Policy Commission*** * In: Inquiry on Federal Water Policy : Montreal, Quebec, November 5-6, 1984 * Oct 1984 * vp

This submission outlines the concerns of the Mohawk Council of Kahnawake on the importance of the water cycle to its way of life and the ongoing destruction of its major water resources. The increasing demand for water is infringing on the First Nations future survival, and the Kahnawake is concerned by such developments as the St Lawrence Seaway project, water pollution from increased industrialization, the hydroelectric Project Archipel, jurisdiction over their territorial waters and lack of water conservation efforts. A supplementary paper expressing serious objection to Project Archipel as a violation of its territorial integrity and environmental control by the Turtle Clan Mohawk nation is presented. A corresponding transcript of hearings in Montreal addressing this submission is attached.

221 (073420)
MORELL AND AREA LAND USE STEERING COMMITTEE * ***Enhancement, conflicts and management of an island river*** * In: Inquiry on Federal Water Policy : Charlottetown, Prince Edward Island, September 26, 1984 * Sept 1984 * vp

Problems and suggested solutions for the Morell River area, Prince Edward Island, are presented on erosion, multiple uses of rivers, need for wilderness, research needs and public education. It is felt that many problems can only be solved by the cooperation of federal and provincial governments with local communities. A brief review of the use of the Island's rivers, highway improvements and soils is provided. A corresponding transcript of the hearings in Charlottetown addressing this submission is attached. Areas explored are public participation in watershed management, cooperation with government agencies and the appropriate role of the federal government in the management of small river systems.

222 (073357)
NECHAKO NEYENKUT * ***Brief of Nechako Neyenkut to the Inquiry on Federal Water Policy*** * In: Inquiry on Federal Water Policy : Vancouver, British Columbia, November 19-23, 1984 * Nov 1984 * vp

Federal and provincial management concerns deserving consideration in a Nechako River (British Columbia) Management Plan are discussed. Federal issues include the Nechako fishery, unresolved Indian land claims, transportation and Migratory Bird Sanctuary protection. Provincial issues include resident fishery and wildlife, irrigation and livestock water and control, domestic/industrial water supply, water quality, erosion, groundwater, and recreation/heritage/aesthetic values. Included among the eight recommendations by the Neyenkut society are: a joint federal/provincial/regional initiative to manage the Nechako watershed; creation of a regional water management authority under existing federal/provincial legislation; and establishment of a Nechako River Management Plan with basic rules for the watershed which local water users and the regional body itself would have to follow. A corresponding transcript of the hearings in Vancouver addressing this submission is attached.

223 (073349)
NECHAKO STEERING COMMITTEE OF THE NECHAKO TASK FORCE * ***Brief to Inquiry on Federal Water Policy by the Nechako Steering Committee of the Nechako Task Froce*** * In: Inquiry on Federal Water Policy : Vancouver, British Columbia, November 19-23, 1984 * Nov 1984 * vp

The Nechako River Management proposal is put forward by the Nechako Task Force, which feels that governments and regional users should be partners in determining flow regimes and in planning for the Nechako River to be sustained as a living resource base for the watershed. Presently the river is controlled and managed by the federal government, the BC government and Alcan (for their Kemano power facility). Implications of three decades of river regulation are discussed. A history of the proposal is outlined. Two appendices contain correspondence sent and received on the subjects and minutes of the Nechako Steering Committee meetings. A corresponding transcript of hearings in Vancouver addressing this submission is attached. Areas explored are a cooperative federal/provincial approach and Alcan's water license granted under the Industrial Development Act.

224 (073348)
NISHGA TRIBAL COUNCIL * ***Submission to the Inquiry on Federal Water Policy on behalf of the Nishga Tribal Council*** * In: Inquiry on Federal Water Policy : Vancouver, British Columbia, November 19-23, 1984 * Nov 1984 * vp

On behalf of the Nishga Tribal Council of northern British Columbia, this submission questions why and how Amax of Canada Limited received special exemption to construct a molybdenum mine and dispose of its tailings into the waters of Alice Arm in direct violation of Canada's national water quality standards. The concern is with the effect that this could have on the water, the people and their way of life. Several excerpts from government scientists' opposition to the project are included in an attachment. A corresponding transcript of the proceedings addressing this submission is also attached. Focus is on the need for a public inquiry to examine this case and for a detailed environmental assessment before any such project is undertaken.

225 (073566)
NISHNAWBE-ASKI NATION * ***Presentation to the Inquiry on Federal Water Policy : Nishnawbe-Aski Nation*** * In: Inquiry on Federal Water Policy : Toronto, Ontario, October 31st to November 2, 1984 * 15 Oct 1984 * vp

The Nishnawbe-Aski nation presents its views on water quantity and quality by relating its concerns on the Ontario Arctic watershed. It is strongly opposed to diversion of Canadian waters to the United States and details the reasons why. Although the use of water for hydroelectric power in Ontario is not opposed, the group stresses that it will request full information on all reports concerning the use of the Arctic watershed for diversion and/or hydroelectric power and will communicate its concerns to the federal government. The poisoning of the English-Wabigoon system is criticized and strong effort by all governments is recommended to ensure a balance among uses to maintain the ecosystem and to maintain and enhance fishing, hunting and trapping. The group further requests that the federal government expand upon its authority to legislate the protection of fisheries and develop water quality standards for the water of the Ontario Arctic watershed. A corresponding transcript of hearings in Toronto addressing this submission is attached.

226 (073325)
NORANDA INC. * ***Noranda Inc. : brief to Inquiry on Federal Water Policy*** * In: Inquiry on Federal Water Policy : Ottawa, Ontario, December 3-10, 1984 * Nov 1984 * vp

This submission deals mainly with water requirements and water needs for the mineral resources sector of Noranda Incorporated. Recommendations are presented on various pertinent issues including water quantity and supply, water quality legislation and guidelines, acid rain and its control both in Canada and the United States, effluent quality control, organizational issues and the federal government's effectiveness in water management, and water research funding and priorities. The corresponding transcript of the hearings in Ottawa addressing this submission is attached. The recommendations are explained in greater detail and the water recycling aspect of Noranda's operations as well as the industry's interaction with the provincial and federal government are explored.

227 (073396)
NORTHERN CANADA POWER COMMISSION * ***Submission of the Northern Canada Power Commission to the Inquiry on Federal Water Policy*** * In: Inquiry on Federal Water Policy : Whitehorse, Yukon, October 15, 1984 * Oct 1984 * vp

Management and control of northern inland waters encompassing existing water usage for hydro generation and all facets of future allocation of water resources in Northern Canada are described as the main concern of the Northern Canada Power Commission. Aspects of their September 1983 brief to the Macdonald Commission emphasizing the importance of water to the economic potential of the northern territories are presented. The Commission recommends that a comprehensive management plan or policy for this resource must fully recognize the enormous remaining potential for hydro power development, and that cost allocations between water users should be restricted to the provision of substitute amenities with inter-user funding requirements forming no part of federal water policy. A corresponding transcript of hearings in Whitehorse addressing this submission is attached. Areas explored are effects of hydro power development on fish, water licensing arrangements and water resource planning.

228 (073517)
NORTHWEST TERRITORIES CHAMBER OF MINES * ***A submission to the Inquiry on Federal Water Policy by the Northwest Territories Chamber of Mines*** * In: Inquiry on Federal Water Policy : Yellowknife, Northwest Territories, October 16, 1984 * Oct 1984 * vp

Recommendations are presented by the mining industry to ensure both efficient operation of mines and maintenance of an acceptable quality of waters in the Northwest Territories. Areas of recommendation include granting of permission to use water, terms of water licenses, combining land and water permitting and enforcement processes, security deposits, priority of use, effluent quality standards, hydroelectric development, export of water, interjurisdictional water matters, governmental responsibility for water, and land use planning. Many of the recommendations require change to existing legislation. A corresponding transcript of hearings in Yellowknife addressing this submission is attached. Areas explored are water licensing, federal/provincial responsibilities and need for cooperation and upstream versus downstream users.

229 (073522)
NORTHWEST TERRITORIES WATER BOARD * ***Challenge, opportunity, and change*** * In: Inquiry on Federal Water Policy : Yellowknife, Northwest Territories, October 16, 1984 * Oct 1984 * vp

Water quality and quantity are major concerns in the Northwest Territories where water supplies could be seriously jeopardized as the result of water management decisions taken in the south. Activities and responsibilities of the Northwest Territories Water Board, which provides for the conservation, development, and utilization of water resources in the Northwest Territories, are detailed. Some Board initiatives which are expected to lead to improvements in the cooperative management of northern water resources are described. This brief sees the challenge ahead to be development of innovative ways to respond to complex water issues. Two supplementary Northwest Territories Water Board publications, a 1983 annual report and its guidelines for municipal type wastewater discharges in the Northwest Territories are included with the brief. A corresponding transcript of the hearings in Yellowknife addressing this submission is attached. Areas explored are integrating water use and waste disposal and one licensing process, and the need for review and revision of the Northern Inland Waters Act.

230 (073429)
NOVA SCOTIA DEPARTMENT OF HEALTH * ***Nova Scotia Department of Health brief to the Inquiry on Federal Water Policy*** * In: Inquiry on Federal Water Policy : Halifax, Nova Scotia, September 18 and 19, 1984 * 1984 * vp

This brief addresses aspects of water supply and sewage disposal where federal jurisdiction has an impact or federal resources could aid in the healthful use of water. Water quality issues addressed include safeguarding of watersheds, determining long- and short-term deleterious effects of airborne pollution with appropriate preventive or treatment techniques, evaluation and certification of water treatment and distribution equipment, national standards or codes for the design and installation of water and sewage works, operation and maintenance of water supplies, monitoring of water supplies and standards for toxic chemicals. Water quantity issues addressed include use of rainwater, consumption, and reduction of volume of on-site waste disposal. An informed source on water issues is suggested instead of an array of federal departments and agencies that deal with water-related matters. This submission forms part of the corresponding transcript of hearings in Halifax. Areas explored are the National Drinking Water Standards Act, need for improved water treatment, and the role of the federal government in water resources management.

231 (073432)
NOVA SCOTIA FEDERATION OF AGRICULTURE * ***Brief of the Nova Scotia Federation of Agriculture to the Inquiry on Federal Water Policy*** * In: Inquiry on Federal Water Policy : Halifax, Nova Scotia, September 18 and 19, 1984 * Sept 1984 * vp

Drawing on the inquiry's participation paper, this submission outlines areas of particular concern to Nova Scotia's agricultural industry. These include high precipitation, high groundwater levels, lack of research on land drainage and engineering, flooding, and shoreline and stream bank erosion; opposition to any regulation or payment system for access to water that will jeopardize agricultural production or put a higher value on conserving for recreational rather than agricultural use; and need to speed up the licensing system of chemicals used in farming recognizing that regulation and testing procedures provide service and protection to the industry. A corresponding transcript of hearings in Halifax addressing this submission is attached. Areas explored are the need for greater federal investment in agriculture and water pricing implications.

232 (073373)
OKANAGAN BASIN WATER BOARD * ***Presentation to Pearse Commission : Inquiry on Federal Water Policy by the Okanagan Basin Water Board*** * In: Inquiry on Federal Water Policy : Kelowna, British Columbia, November 28, 1984 * 1984? * vp

This submission states that there are many water resource management problems which threaten the future of Okanagan Valley water supplies despite the efforts of provincial and local government and the valley communities. Concerns of the Okanaga Basin Water Board in the areas of wastewater treatment, aquatic weed growth, toxic chemicals, water quantity and recreation are examined. Specific recommendations include continued emphasis in areas of research and financing of wastewater treatment improvements; development of new methods of aquatic weed control; continued monitoring to establish guidelines for toxic chemicals in the environment; and enhanced recreation and tourism by participation from government in public foreshore development. A corresponding transcript of hearings in Kelowna addressing this submission is attached.

233 (073563)
ONTARIO FEDERATION OF ANGLERS AND HUNTERS * ***Presentation to the Inquiry on Federal Water Policy : by the Ontario Federation of Anglers and Hunters*** * In: Inquiry on Federal Water Policy : Toronto, Ontario, October 31st to November 2, 1984 * 01 Nov 1984 * vp

The ongoing destruction of wetlands and the loss of this resource to the people of Ontario and Canada is detailed. The diversity of competing uses and resource values associated with wetlands has resulted in a resource use conflict of particular concern when dealing with water quantity and quality issues. The conversion of wetlands mainly for agricultural production and its effect on wildlife are described. It is recommended that in order to slow down the loss of Canada's wetlands, the federal government should permanently

withdraw the one-third subsidy for drainage proposals. The proposal should also include a cost-benefit analysis and an environmental impact assessment. Furthermore, the federal Fisheries Act should address the need for cost-benefit analysis and additional approvals from the provincial natural resources ministry before a proposal could proceed. The impact of diversion into the Great Lakes Basin on recreational fishing though falling water levels is also highlighted. A public education program addressing the need for conservation is necessary to preserve the Great Lakes levels. A corresponding transcript of hearings in Toronto addressing this submission is attached.

234 (073576)
ONTARIO HYDRO * ***Submission to the Inquiry on Federal Water Policy : Ontario Hydro*** * In: Inquiry on Federal Water Policy : Toronto, Ontario, October 31st to November 2, 1984 * Oct 1984 * vp

By employing large volumes of water, Ontario Hydro confronts many complex issues which fall under the Inquiry's categories of quantity, quality and water management. Although it is a large user of water in hydroelectric and thermal generation, Ontario Hydro stresses that it is not a large consumer of water since almost all of the water is returned immediately to the natural system after use. The industry is extensively regulated with issues addressed by governmental constraints and self-imposed restraints. Ontario Hydro recognizes that managing water requires a rational and logical system which should be based on three principles: the drainage basin is the basic policy unit; decisions must proceed from a cooperative, interjurisdictional approach; and environmental, social and economic benefits must be optimized in an integrated way. A corresponding transcript of hearings in Toronto addressing this submission is attached. Areas explored are water use rental and public involvement.

235 (073328)
ONTARIO SOCIETY FOR ENVIRONMENTAL MANAGEMENT * ***Submission to Inquiry on Federal Water Policy by Ontario Society for Environmental Management*** * In: Inquiry on Federal Water Policy : Ottawa, Ontario, December 3-10, 1984 * Oct 1984 * vp

The lack of a holistic approach to water management and water control projects, obstacles to that approach, issues that demand such an approach, and other matters of current concern are described in this submission. Issues specifically addressed are environmental degradation, water supply decontamination, acid rain, the greenhouse effect, institutional rigidities, Canada/United States relationships, and Canada/provincial relationships. Other areas discussed include water supply and demand, public participation, and research activities. Better water resources management strategies with concomitant evolution of institutional arrangements are urged. The corresponding transcript of the hearings in Ottawa on this submission is attached. Areas explored are institutional rigidity, a national water model, intergovernmental cooperation, and the need for increased public participation.

236 (073557)
ONTARIO WATER WELL ASSOCIATION * ***Brief to the Inquiry on Federal Water Policy : the Ontario Water Well Association*** * In: Inquiry on Federal Water Policy : Toronto, Ontario, October 31st to November 2, 1984 * 17 Oct 1984 * vp

Concerns about groundwater quality and quantity are addressed in this submission. The federal government could have responsibility for areas such as groundwater potential, contamination susceptibility, and bedrock and overburden aquifer maps, while the provincial government could concentrate on enforcing provisions of the various groundwater-related acts. The federal government must show a strong presence, and this can be achieved through a number of federal acts giving the Department of the Environment primary responsibility for water resources management from a national point of view. A particular concern outlined is the use of groundwater heat pumps and possible effects on groundwater quality. A corresponding transcript of hearings in Toronto addressing this submission is attached. Areas explored are federal/provincial cooperation and the federal government's role in groundwater data collection.

237 (F13126)
ORDRE DES INGÉNIEURS DU QUÉBEC * ***Les eaux au Canada maintenant et demain : mémoire de l'Ordre des ingénieurs du Québec présenté au Comité d'enquête sur la politique fédérale relative aux eaux*** * In: Transcript of hearings : Inquiry on Federal Water Policy, Montréal, Québec, November 5 & 6, 1984 * nov 1984 * 19p

Ce document est divisé en quatre chapitres. Le premier chapitre traite des réserves et de l'utilisation de l'eau douce au Canada; la situation canadienne, la situation québécoise, ainsi que le contexte nord-américain y sont abordés. Le second chapitre correspond aux questions de quantité et de qualité des eaux (pénuries et inondations, produits chimiques toxiques, précipitations acides et effluents) et mentionne les conflits d'utilisation. Le chapitre trois traite de la gestion des ressources en eau, tandis que le dernier chapitre donne des remarques sur les recherches hydriques. Il faut mentionner que chaque chapitre comporte une série de recommandations formulées par les membres du groupe de travail ayant rédigé le document.

238 (073508)
ORGANIC PRODUCERS MARKETING COOPERATIVE LIMITED * ***Presentation to Federal Water Policy Enquiry by the Organic Producers Marketing Cooperative Limited (i.e. Inquiry)*** * In: Inquiry on Federal Water Policy : Saskatoon, Saskatchewan, October 23, 1984 * 1984? * vp

A soil and water policy guaranteeing the highest possible quality of water to all Canadians is urged in

this brief. It is further recommended that water export to the United States be prohibited and the use of agricultural chemicals be banned or phased out. Recommendations are also presented for research on iron, sulphates, salt, water softness, algae and relationship of ground water to surface water. A second brief by the Canadian Organic Producers Marketing Cooperative Limited outlines the organic trend in agriculture production particularly in Saskatchewan, reasons for it, and some of the pitfalls that will require policy changes at all levels of government. This submission was made to a Senate Committee, but reiterates the need for a soil and water conservation strategy geared to the production of nutritious food as outlined in the brief to the Inquiry. A corresponding transcript of hearings in Saskatoon addressing this submission is attached.

239 (073337)
OTTAWA CHAPTER OF THE CANADIAN METEOROLOGICAL AND OCEANOGRAPHIC SOCIETY * ***A submission to the Inquiry on Federal Water Policy : presented by the Ottawa chapter of the Canadian Meteorological and Oceanographic Society*** * In: Inquiry on Federal Water Policy : Ottawa, Ontario, December 3-10, 1984 * Dec 1984 * vp

This brief submission urges the Inquiry to recommend that all major decisions affecting river flow should first consider not only factors interior to the continent but also the impact on Canada's coastal and estuarine regions. Good management should be based on conservation and recycling. There is real evidence that the freshwater cycle impacts on coastal circulation patterns and marine fisheries. The corresponding transcript of the hearings in Ottawa addressing this submission is attached.

240 (073336)
OTTAWA FIELD-NATURALISTS' CLUB * ***Federal Water Policy, the nation's water management puzzle : wetlands an important missing piece*** * In: Inquiry on Federal Water Policy : Ottawa, Ontario, December 3-10, 1984 * Oct 1984 * vp

Official recognition of wetlands as an essential component of Canada's water resources is the first step in ensuring the preservation, management and enhancement of this resource in the face of land use struggles. The inclusion of wetlands under the Canada Water Act would be indicative of the adoption of a more holistic approach to water resources management in Canada. A national wetlands act would offer the best solution. If this recognition is not granted, Canada's water policy cannot realize its water resource management objectives. The corresponding transcript of the hearings in Ottawa addressing this submission is attached. Areas explored at the hearing were the relation between wetlands and agriculture and wetland legislation.

241 (073411)
PADDLEWHEEL RIVERBOAT CRUISES * ***Brief of the Paddlewheel Riverboat Cruises to the Inquiry on Federal Water Policy*** * In: Inquiry on Federal Water Policy : Winnipeg, Manitoba, October 24, 1984 * Oct 1984 * vp

The unique conditions and problems of tour boat operators are discussed by recounting particular concerns of Paddlewheel Riverboat Cruises of Manitoba on jurisdictional responsibility. The federal government has responsibility for commercial docks and wharfs on commercially navigable water systems, while the province supplies docking in such areas as provincial parks. The Company's problem of finding a new docking area was complicated by crossing of jurisdictions between the federal government, which operated the bridge in the docking area, and the city of Winnipeg. Other general Canadian concerns are discussed. These include establishing sovereignty and delineating boundaries in marine areas; active participation in international bodies to fight pollution of international waters; placing more emphasis on waterways' importance for tourism and recreation; and taking strong positions to prevent water contamination. A corresponding transcript of hearings in Winnipeg addressing this submission is attached.

242 (073496)
PEIGAN BAND * ***A position on Peigan water rights*** * In: Inquiry on Federal Water Policy : Calgary, Alberta, October 9 & 10, 1984 * 1984? * vp

Water rights of the Peigan people of Alberta are detailed by citing applicable legislation and agreements on Indian reserve lands. This land is shown to be jurisdictionally distinct by law from any other lands within provincial boundaries. It is the same for resources, including water resources, located on Indian reserve lands. In light of provincial plans to dam the Oldman River, the Peigan Chief and Council have made a bylaw to protect their water and irrigation development. They reject the claim that existing legislations shows ownership of the Oldman River falling under provincial jurisdiction. Consultation with Indian people is necessary before any decisions or agreements affecting Indian water are made. A corresponding transcript of hearings in Calgary addressing this submission is attached.

243 (073533)
PEMBINA INSTITUTE FOR APPROPRIATE DEVELOPMENT * ***Brief presented to the Federal Water Inquiry by the Pembina Institute for Appropriate Development*** * In: Inquiry on Federal Water Policy : Edmonton, Alberta, October 12, 1984 * Oct 1984 * vp

Ten criteria that a federal water policy must be designed to meet and against which that policy must be continuously evaluated are established and presented. Recommendations for a federal water policy fall into five categories: management structure; water conservation and demand management; least possible disturbance of natural water bodies, especially rivers; water quality and point source inputs; and water quality and

non-point source inputs. A corresponding transcript of hearings in Edmonton addressing this submission is attached.

244 (073353)
PETER WARD & ASSOCIATES LTD. * ***Planning & engineering management : lower Fraser and other major estuaries*** * In: Inquiry on Federal Water Policy : Vancouver, British Columbia, November 19-23, 1984 * Nov 1984 * vp

This brief correspondence recommends scientific and engineering studies initiated by the federal government on the lower Fraser and other major estuaries in British Columbia covering the areas of channel stability and bank erosion, rate of estuary delta front growth, dyke adequacy and flood hazards, and borrow dredging from construction. The brief stresses that correct management of the river and estuary can only come about if the hydrological behaviour of the river is well understood. Attached is a corresponding transcript of the hearings in Vancouver addressing this submission which explores in greater detail the areas of estuarine research where information gaps exist.

245 (073329)
PETROLEUM ASSOCIATION FOR CONSERVATION OF THE CANADIAN ENVIRONMENT (PACE) * ***The Petroleum Association for Conservation of the Canadian Environment (PACE) : submission to the Inquiry on Federal Water Policy*** * In: Inquiry on Federal Water Policy : Ottawa, Ontario, December 3-10, 1984 * Nov 1984 * vp

This submission outlines concerns and beliefs of the Petroleum Association for Conservation of the Canadian Environment (PACE) on specific issues including existing federal water policy objectives, water quantity, water quality, demands on water ressources, federal/provincial water management, new structure of Environment Canada, international issues, and ongoing research regarding water quality issues. Activities by PACE to address issues of water conservation, toxic and persistent chemicals, acid rain and groundwater are described. The corresponding transcript of the hearings in Ottawa on this submission is attached. Areas explored include the effects of petroleum industry activities on groundwater quality and the role of government in environmental quality protection.

246 (073401)
PIP, E. * ***Municipal water supply sources : it's time to take a responsible look*** * In: Inquiry on Federal Water Policy : Winnipeg, Manitoba, October 24, 1984 * Oct 1984 * vp

Present policy appears to be inadequate with regard to decisions affecting surface water bodies which are also municipal water supply sources. The problem is exemplified by the case of Shoal Lake, the source of water for the city of Winnipeg where a proposed massive cottage lot development threatens Indian Bay where the city's water system intake is located. It is concluded that municipal water supply sources should be protected and given special status to ensure that they are not endangered by irresponsible actions. Eleven conditions on the use of these waters are listed. A corresponding transcript of hearings in Winnipeg addressing this submission is attached. Areas explored are extent of federal involvement in Shoal Lake as an interjurisdictional body of water and the need for protection of a municipal water supply source.

247 (073494)
PRAIRIE ASSOCIATION OF WATER MANAGEMENT * ***Submission to the Inquiry on Federal Water Policy submitted by the Prairie Association of Water Management (PAWM)*** * In: Inquiry on Federal Water Policy : Calgary, Alberta, October 9 & 10, 1984 * Oct 1984 * vp

This submission summarizes issues and strategies pertinent to water resources management in the Prairies. It includes a discussion of precedents of federal-level concern in regionally based water management problems and some principles to guide the direction of policies for management of the Prairie's water resources. Water management in this region is assessed as being one of distribution rather than of availability of supply. Some problems typical of the Prairie region are described. Two basic goals of water resource management are to maximize conservation in the use of presently available water supplies and to increase present water supplies to meet present and future demands. A two-phased strategy for meeting these goals is outlined. The type of roles the federal government could assume in this region's water resources include federal/provincial cooperation, facilitative role in development of policies that ensure equitable water distribution, and provision of funding for public awareness programs. A corresponding transcript of hearings in Calgary addressing this submission is attached.

248 (073416)
PRAIRIE FARM REHABILITATION ADMINISTRATION * ***Water and prairie agricultural development*** * In: Inquiry on Federal Water Policy : Regina, Saskatchewan, October 22, 1984 * Prairie Farm Rehabilitation Administration, Regina, Sask * Oct 1984 * vp

Federal water policy should be developed in consultation with the provinces taking into account needs of a wide variety of users and special needs of prairie agriculture regarding quantity and quality of water supplies. Water requirements for the prairie agricultural sector compounded by severe drought conditions are examined. Sustained economic growth on the prairies will be closely tied to well-conceived water resources development and management especially in agriculture. In the area of agricultural water development, several factors are discussed: increased irrigation contributing to new levels of agricultural production; water supplies provision for on-farm domestic and stock watering use; improved water supplies and sewage disposal systems for rural farm service centres; and multilevel cooperation encompassing provincial and federal governments,

municipalities, business sector and other groups interested in sound long-term development of prairie water supplies. The corresponding transcript of hearings in Regina addressing this submission is attached.

249 (073421)
PROVINCE OF NEW BRUNSWICK • ***A brief to the Inquiry on Federal Water Policy submitted by the Province of New Brunswick*** = Mémoire présenté par la province du Nouveau-Brunswick dans le cadre de l'Enquête sur la politique fédérale relative aux eaux • In: Inquiry on Federal Water Policy : Fredericton, New Brunswick, September 20, 1984 • Sept 1984 • vp

A coherent national water policy including research, planning, implementation and enforcement must include all levels of government. Since both the federal and provincial governments have responsibilities in water administration, the practice of joint agreements and programs could be expanded. The federal government plays several roles in water administration in New Brunswick. The province would like these roles brought together into a coordinated, focused program delivery and hopes that Canada would cooperate in the funding of water programs directed at national and provincial goals like safe drinking water supplies, improved fish management and economic and social development. It is believed that while provincial responsibilities for managing their water resources are becoming well defined, the federal role lacks focus and consistency. A corresponding transcript of the hearings in Fredericton addressing this submission is attached. Areas explored are water export and drinking water quality standards.

250 (073575)
PROVINCE OF ONTARIO • ***Submission to the Inquiry into Federal Water Policy : Province of Ontario (sic)*** • In: Inquiry on Federal Water Policy : Toronto, Ontario, October 31st to November 2, 1984 • Sept 1984 • vp

This brief provides an overview of the position to the Government of Ontario on water issues and presents a consolidation of the viewpoints, concerns and opportunities voiced by the individual ministries of the Government. The significance of water resources to Ontario is described. Three principles define a philosophy or an approach to water management issues of concern to Ontario: the watershed or drainage basin is the primary geographic basis for water management policy, planning and implementation; water requires multijurisdictional, cooperative management; and water is a renewable natural resource that must be managed to provide optimum economic, social and environmental benefits. Observations on federal/provincial interaction are provided in the areas of research and development, technology transfer, structural organization, data collection and analysis and national drinking water guidelines. The Government of Ontario intends to encourage a more constructive approach to federal/provincial cooperation for the establishment of mutually beneficial water management strategies. A corresponding transcript of hearings in Toronto addressing this submission is attached.

251 (073558)
PROVINCE OF ONTARIO, MINISTRY OF NATURAL RESOURCES • ***Submission to the Inquiry on Federal Water Policy : Ministry of Natural Resources, Province of Ontario*** • In: Inquiry on Federal Water Policy : Toronto, Ontario, October 31st to November 2, 1984 • Oct 1984 • vp

This submission discusses the goals and objectives of the Ontario Ministry of Natural Resources and describes its future plans for water quantity management in Ontario. The three objectives outlined are resource development, resource conservation, and public safety. A series of existing and/or emerging water management issues are described with specific reference to the impacts on the Ministry's policies and programs. The discussion of issues is organized into four program areas with each containing a statement of the issue or issues, a short discussion of the effects of that issue and finally a suggestion for the federal or federal/provincial initiatives required. These are water management (hydrometric data, national guidelines and criteria, consumptive uses, diversions); fisheries management (bathymetric surveys, 1976 Canada/Ontario Agreement); wildlife management; and mineral resources management. Of particular importance to the Ministry is a commitment by all jurisdictions to develop water management programs on a watershed basis. Two documents are included with this submission: the Ministry's 1983-84 annual report and the Ministry Management system outlining management processes currently in place. A corresponding transcript of hearings in Toronto addressing this submission is attached.

252 (073393)
QUEENSTAKE RESOURCES LTD. • ***Queenstake Resources Ltd. : submission to Inquiry on Federal Water Policy*** • In: Inquiry on Federal Water Policy : Whitehorse, Yukon, October 15, 1984 • Sept 1984 • vp

The strong role of the placer mining industry in the Yukon is described with recommendations for the development of guidelines which recognize the needs of the industry and its reliance on water resources. To focus on this water use issue, a brief review is provided on the nature of a placer deposit, development of the industry and its impact on the water resources of the Yukon. Concerns expressed are that costly environmental quality standards and unrealistic placer mining guidelines will irreparably damage the industry; the difficulty of the federal Fisheries Department and the Environment Department to apply national objectives to such a local industry; and the economic benefits of mining outweigh the short-term effect on the environment and freshwater fish habitat. Attached is a corresponding transcript of hearings in Whitehorse addressing this submission with the focus on the effects placer mining has on environmental and water quality.

253 (073338)
RAWSON ACADEMY OF AQUATIC SCIENCE • ***Canadian waters : some strategic considerations affecting the future of the resource*** • In: Inquiry on Federal Water Policy : Ottawa, Ontario, December 3-10, 1984 • Dec 1984 • vp

Three aquatic resource issues requiring a strong federal presence are water contamination, acid rain, and the biological implications of diversions. The major recommendations in this submission are that the Inquiry consider ways of fostering and encouraging long-term ecosystem perspectives mainly by the federal, provincial and municipal governments; that the federal government should assume a leadership role in the development of information on and understanding of issues involving the aquatic resource; and that an Ecosystem Research Board of Canada be given a mandate for long-term strategic research. Human resource considerations, particularly manpower problems affecting Canadian aquatic science, are described. The corresponding transcript of the hearings in Ottawa addressing this submission is attached.

254 (073339)
REGIER, H.A. • ***A brief to the Enquiry on Federal Water Policy on the husbandry of aquatic ecosystems (i.e. Inquiry)*** • In: Inquiry on Federal Water Policy : Ottawa, Ontario, December 3-10, 1984 • Dec 1984 • vp

This brief contends that after gross mismanagement of Canada's aquatic systems, environmental, social and political reforms are needed to achieve ecosystem husbandry. Focus in this brief is on the Great Lakes. Detailed sections are included on degradation of the ecosystem, elements of the allocative process, policy mechanisms and their implications on the allocative outcome, market economics, participatory bargaining and optimum use. The three desirable features of an allocative process are described as information, representation and cost-effectiveness. The ideas of a conserver society should be related to sustainable redevelopment rather than to a worn-out concept of conservation. The corresponding transcript of the hearings in Ottawa addressing this submission is attached.

255 (073370)
REGIONAL DISTRICT OF FRASER-CHEAM • ***Brief of Regional District of Fraser-Cheam to the Federal Inquiry on Water Policy*** • In: Inquiry on Federal Water Policy : Vancouver, British Columbia, November 19-23, 1984 • Nov 1984 • vp

This brief encourages the Government of Canada to establish new programs to assist local communities and unincorporated areas to deal with the provision of water supply and sewage disposal systems. The Regional District of Fraser-Cheam in British Columbia was established in 1967 long before sound design and installation criteria for on-site servicing systems were enforced. Improvement in local services is needed but is constrained by lack of financial support. The recommendations address potential dangers to public health. A corresponding transcript of hearings in Vancouver addressing this submission is attached. Areas explored are reasons for federal involvement and extent of local interest in this problem.

256 (073402)
RÉGNIER, M. • ***Brief of Mr. Maurice Régnier to the Inquiry on Federal Water Policy*** • In: Inquiry on Federal Water Policy : Winnipeg, Manitoba, October 24, 1984 • Sept 1984 • vp

This personal submission details with copies of all correspondence expropriation of land in the regional municipality of St François Xavier, Manitoba, from the presenter for disposal of waste. Concerns about the effects of this dumping on drain water which leads to the Assiniboine River and about the lack of proper maintenance of similar nuisance lands property purchased previously from the presenter are detailed. A corresponding transcript of hearings in Winnipeg addressing this submission is attached. A particular area explored is the frustration faced by individuals when dealing with various levels of government with different jurisdictions and responsibilities in the area of pollution control.

257 (073388)
SAANICH PENINSULA FARMERS INSTITUTE • ***The high cost of irrigation water to Saanich Peninsula farmers*** • In: Inquiry on Federal Water Policy : Victoria, British Columbia, November 26, 1984 • 1984? • vp

The Saanich Peninsula Farmers Institute's submission outlines reasons why the peninsula with its long growing seasons and great potential for intensive farming is in danger of disappearing as a producing area. The needs of the agricultural community for lower-priced irrigation water supply are highlighted. The Institute believes that the federal government should give substantial financial assistance and that the provincial government should ensure that agricultural land is serviced for water and farmers encouraged to farm every available acre. A corresponding transcript of hearings in Victoria addressing this submission is attached. Areas explored are federal/provincial cooperation on irrigated lands, agricultural dependence on irrigation in the Saanich Peninsula and use of water by farmers.

258 (073424)
SAINT JOHN RIVER BASIN HYDROLOGY COMMITTEE • ***Submission to the Inquiry on Federal Water Policy by the Saint John River Basin Hydrology Committee*** • In: Inquiry on Federal Water Policy : Fredericton, New Brunswick, September 20, 1984 • Aug 1984 • vp

The Saint John River Basin Hydrology Committee expresses concern about the discontinuance of the remaining snow survey network in New Brunswick and strongly recommends that this decision be reconsidered by the Inland Waters Directorate. Eight reasons are advanced to support this recommendation. This

submission specifically recommends that the Inland Waters Directorate define and establish a mandate for snow pack data collection and archiving review and continue its current programs of snow surveys with expansion of provincial networks; and that federal research groups be encouraged to develop new instrumentation and measurement techniques for snowpack measurement. A corresponding transcript of hearings in Fredericton addressing this submission is attached.

259 (073417)
SASKATCHEWAN URBAN MUNICIPALITIES ASSOCIATION * ***Brief presented to the Inquiry on Federal Water Policy for Saskatchewan Urban Municipalities*** * In: Inquiry on Federal Water Policy : Regina, Saskatchewan, October 22, 1984 * 1984? * vp

This submission recommends an overall provincial policy for management of water resources in Saskatchewan within which local urban government can function. Issues that must be addressed include determination of responsibilities for water covering supply, distribution, quantity, quality and maintenance; sewage treatment covering rules and regulations, financing and effluent usage; drainage, both municipal and provincial; agricultural impact; irrigation; and flood control. Recommendations are made in all these areas. A corresponding transcript of the hearings in Regina addressing this submission is attached.

260 (073313)
SASKATCHEWAN WATER CORPORATION * ***Brief presented to the Pearse Inquiry on Federal Water Policy by the Saskatchewan Water Corporation*** * In: Inquiry on Federal Water Policy : Ottawa, Ontario, December 3-10, 1984 * Dec 1984 * vp

The relationship between the Saskatchewan Water Corporation and the federal government in water management matters is highlighted in this brief. Steps taken by the Saskatchewan government to deal with the future of water resources in the province are outlined. The need to work cooperatively with the federal government to identify problems and provide solutions to water resources management is stressed. Sections are included on water resource developments in Saskatchewan, the role of the federal government in water management, and current Canada/Saskatchewan water management matters including water planning, development of water schemes, operation and maintenance of Saskatchewan dams and reservoirs, drought, water research, flood damage reduction, pollution prevention and water quality management, and small water development assistance programs. An attachment containing details on water matters of concern to Saskatchewan in its dealings with the federal government is included. The corresponding transcript of the Ottawa hearings addressing this submission is attached.

261 (073511)
SASKATCHEWAN WATER WELL ASSOCIATION * ***Brief of the Saskatchewan Water Well Association to the Inquiry on Federal Water Policy*** * In: Inquiry on Federal Water Policy : Saskatoon, Saskatchewan, October 23, 1984 * Oct 1984 * vp

More stringent policies of prevention of groundwater contamination are urged in the areas of oil and gas wells, industrial spills of dangerous chemicals, uncontrolled waste product dumping practices and tighter control of manufacturing and distribution of agricultural chemicals. Because groundwater supplies are becoming important today as a source of fresh water, a great deal of research is needed to determine and document the parameters and quality of aquifers. A federal management policy should be aimed at coordination of local organizations, contractors and provincial governments to control groundwater pollution. An interdepartmental committee on water should develop coordinating policy and legislation on water well management. This brief forms part of the corresponding transcript of hearings in Saskatoon addressing this submission.

262 (073415)
SASKATCHEWAN WILDLIFE FEDERATION * ***Saskatchewan Wildlife Federation brief to the Inquiry on Federal Water Policy*** * In: Inquiry on Federal Water Policy : Regina, Saskatchewan, October 22, 1984 * Oct 1984 * vp

This submission views the loss of natural habitat, particularly wetlands, as the most critical issue facing Saskatchewan's wildlife resource. The Heritage Marsh Program is dedicated to preserving prairie wetlands and wildlife habitats. Recommendations made to further preserve Saskatchewan's wetlands include alternatives to costly and destructive drainage programs; water conservation program encouraging retention of water and wetlands; redesigning of the Grain Quota Marketing System; incentive programs encouraging landowners to maintain wetlands; land acquisition in flood-prone areas; and a national program to secure, preserve and manage prairie wetlands. The corresponding transcript of the hearings in Regina addressing this submission is attached. Areas explored include improved drainage versus wetlands conservation, waterfowl crop depredation and duck population decline.

263 (073560)
SAVE OUR STREAMS INC. * ***Inquiry on Federal Water Policy : brief by Save Our Streams Inc.*** * In: Inquiry on Federal Water Policy : Toronto, Ontario, October 31st to November 2, 1984 * 1984 * vp

This submission by a conservation group stresses that a strong federal policy promoting sound land use practices can only help to influence decisions made at provincial and local levels. The group recommends that each watershed must be viewed and managed as a whole; consumptive users must leave sufficient flow during each season for all users downstream; non-consumptive users must release water of the same quality as received; and all runoff from manmade structures should be contained on site prior to release to receiving watercourses. Natural streams and watercourses are

seen as a type of barometer indicating the overall condition of the natural environment. A corresponding transcript of hearings in Toronto addressing this submission is attached.

264 (073351)
SAVE THE BULKLEY • ***River management : people and their rivers*** • In: Inquiry on Federal Water Policy : Vancouver, British Columbia, November 19-23, 1984 • Nov 1984 • vp

This submission highlights the experience of Bulkley Valley residents respecting Alcan's diversion of a large share of the Nechako River to the Kemano River in British Columbia, describes the problems that have been encountered and analyzes their implications for sound water resources management. The history of the Nechako since the grant was made to Alcan in 1950 and the nature of Alcan's proposed Kemano completion project are discussed. The lack of development of equitable legal and administrative arrangements for water management policies and programs that can respond to the different conditions found in each region of Canada is stressed. Five principles are suggested to alleviate this situation. A corresponding transcript of the hearings in Vancouver addressing this submission is attached. Areas explored are a proposed river management board and responsibilities of the federal Fisheries Department.

265 (073391)
SIERRA CLUB OF WESTERN CANADA; VICTORIA GROUP OF THE SIERRA CLUB OF WESTERN CANADA • ***Submissions by the Sierra Club of Western Canada and the Victoria Group of the Sierra Club of Western Canada*** • In: Inquiry on Federal Water Policy : Victoria, British Columbia, November 26, 1984 • 1984? • vp

These two submissions by the Sierra Club address separate concerns on water policy in British Columbia. The first submission presents comprehensive management plans which take into account flood plains, water inventory, urban systems and ground and surface water with strong opposition to interbasin transfer, water exports and construction of hydroelectric dams for energy exports. The need for Vancouver Island estuaries to be protected and/or enhanced to maintain their value for waterfowl habitat, wildlife, fish habitat, recreation and mariculture is examined in the second submission, which also recommends various actions the federal government could undertake to achieve this. The Club feels that where the federal government does not have direct jurisdiction in water management, leadership should be exercised by directing funding toward environmentally responsible goals. A corresponding transcript of hearings in Victoria addressing this submission is attached.

266 (073519)
SLAVE RIVER BASIN COALITION • ***Federal water policy issues*** • In: Inquiry on Federal Water Policy : Yellowknife, Northwest Territories, October 16, 1984 • Oct 1984 • vp

This brief identifies the major water resources management issues in the Northwest Territories and stresses the desire for people at the local level to contribute to the decision processes that deal with water and land resources. Concerns and recommendations are presented on transboundary water management; need for a comprehensive water use policy north of 60; native people and federal water policy management; need to strengthen the mandate of the Northwest Territories Water Board; compensation policy for water resources impact zone recipients; need for third party involvement in decision and regulatory processes; inventory-taking policy; need for strict enforcement of the Federal Migratory Bird Convention Act habitat protection; consumptive federal water resource development and cost-benefit analysis; social, economic and environmental impact assessments of water resource projects; and need for a northern-based research team and data bank. A corresponding transcript of hearings in Yellowknife addressing this submission is attached.

267 (073520)
SLAVE RIVER DEVELOPMENT IMPACT ZONE SOCIETY • ***Community perspectives on transboundary management issues*** • In: Inquiry on Federal Water Policy : Yellowknife, Northwest Territories, October 16, 1984 • Oct 1984 • vp

This submission identifies some of the jurisdictional uncertainties involved in the Slave River hydroelectric project, examines the operation of the Northwest Territories Water Board under the Department of Indian Affairs and Northern Development (DIAND), identifies and discusses the lack of interjurisdictional structures and processes for water management, and puts forward recommendations on the issues discussed. Six major recommendations are presented including need for the Mackenzie River Basin Committee to quickly negotiate the seven bilateral agreements and a master agreement between the federal government and the provinces concerned; transfer of regulation over water in the Northwest Territories (NWT) from DIAND control to joint control with the NWT government; licenses for non-consumptive use of water and their protection should operate under the NWT Water Board; and an integrated federal water resource policy should include specific policy statements on water export and interbasin transfer. A corresponding transcript of hearings in Yellowknife addressing this submission is attached.

268 (F13130)
SOCIÉTÉ POUR VAINCRE LA POLLUTION • ***Mémoire de la Société pour vaincre la pollution (S.V.P.) à la Commission d'enquête sur la politique fédérale relative aux eaux*** • In: Transcript of hearings : Inquiry on Federal Water Policy, Montréal, Québec, November 5 & 6, 1984 • nov 1984 • 24p

Ce document est divisé en trois parties distinctes. La première partie traite des questions relatives à la qualité de l'eau; la deuxième partie aborde les questions de la gestion de l'eau; la dernière partie fait état des responsabilités face à la pollution de l'eau. Pour

chaque partie, la Société fournit des recommandations. En ce qui concerne la qualité de l'eau, la Société insiste sur le droit à l'eau pure, exempte de toute substance toxique, montre le besoin d'évaluer la contamination de l'eau et met en lumière l'immunité des grands polueurs industriels, les cancers chez les poissons et la contamination des sédiments des fonds aquatiques. Le problème du traitement des eaux usées est abordé, de même que celui de l'industrie nucléaire. Enfin, la Société montre son inquiétude face aux pluies acides.

269 (073387)
SOCIETY PROMOTING ENVIRONMENTAL CONSERVATION * ***A critique of the Fraser River Estuary Study*** * In: Inquiry on Federal Water Policy : Victoria, British Columbia, November 26, 1984 * Nov 1984 * vp

The Society Promoting Environmental Conservation has prepared a three-part submission to the Inquiry including a detailed critique of the Fraser River study, an implementation strategy for the Fraser River Estuary Management Program; a general discussion on the main points of concern in the critique; and the Society's brief to the Inquiry. Concerns with the Fraser River study include the ineffectiveness of the proposed management committee without legal basis and adequate budget; the need for greater public involvement in the management program; and the need for immediate legislation to protect conservation and undetermined use areas. The brief stresses that the amount and quality of Canadian water is not negotiable, that all development must submit a watershed approach Environmental Impact Assessment prior to construction, and clean water should be denied to any industry with sulfurous or nitrous emissions unless it is actively involved in eliminating them. A corresponding transcript of hearings in Victoria addressing this submission is attached.

270 (073375)
SOUTH OKANAGAN-SIMILKAMEEN UNION BOARD OF HEALTH * ***Brief of the South Okanagan-Similkameen Union Board of Health to the Inquiry on Federal Water Policy*** * In: Inquiry on Federal Water Policy : Kelowna, British Columbia, November 28, 1984 * 1984? * vp

Concerns regarding water quality in the Okanagan Valley, particularly the potential danger by heavy metals to human health, are presented. Recommendations are listed as the need for an expanded Canada Water Act encompassing more comprehensive water quality standards; legislation on multiple use of water resources and regulations for industrial shutdown; better monitoring of water resources to provide information on the present state of water quality; more research into health aspects of water pollutants and on sewage and industrial waste disposal; and a water-related laboratory facility for the Okanagan Valley to monitor a wider range of substances. An appendix outlines information suggesting that molybdenum may be hazardous to human health. A corresponding transcript of hearings in Kelowna addressing this submission is attached. Focus is on the need for enforceable or legislative drinking water quality standards and for federal/provincial water quality assessment agreements.

271 (073379)
SOUTHERN INTERIOR GROUP OF THE SIERRA CLUB OF WESTERN CANADA * ***A presentation to the Inquiry on Federal Water Policy by the Southern Interior Group of the Sierra Club of Western Canada*** * In: Inquiry on Federal Water Policy : Kelowna, British Columbia, November 28, 1984 * 1984? * vp

Drawing on reports and concerns by several groups in the Okanagan Lake area, this brief presents the argument that water in the Okanagan Valley system is endangered because of decay in the installed regulatory structure, a misguided overuse of the forestry resource and a reliance on water-contaminant guidelines which are legally unenforceable. The remedies proposed to correct these problems are to create a water authority under federal leadership with a more democratically representative membership; to establish legal water quality standards and regulations to enforce them; and to encourage public awareness by creating local environmental schools and laboratories. A corresponding transcript of hearings in Kelowna addressing this submission is attached. Areas explored are the makeup and expertise of the Okanagan Basin Water Board and the threat of logging to the basin's water quality.

272 (073565)
SPENCE, E.S. * ***Brief presented to the Inquiry on Federal Water Policy by Edward S. Spence of York University*** * In: Inquiry on Federal Water Policy : Toronto, Ontario, October 31st to November 2, 1984 * 02 Nov 1984 * vp

The role of federal water policy in the management of Canada's water resources is discussed. Outlined is a decade of experience with federal involvement in Canada Water Act based cooperative projects in many areas of the country. The 1978 Federal Policy Statement on Inland Waters also set out an appropriate federal role, and this submission comments on several of its stated policies. It is recommended that the federal government strive to develop minimum national guidelines and standards; continue support of water-related research; assume a significant role in public education on water issues; and ensure continued collection of water quality and quantity data. The Inland Waters Directorate must be given a higher profile by possible integration of other federal water-related functions and programs. A corresponding transcript of hearings in Toronto addressing this submission is outlined. Areas explored are management by watershed and strengths and fragmentation of federal administrative agencies and Canada Water Act authority.

273 (073561)
STAGG, M.B. * ***Brief of Mr. Mark B. Stagg to the Inquiry on Federal Water Policy*** * In: Inquiry on Federal Water Policy : Toronto, Ontario, October 31st to November 2, 1984 * Sept 1984 * vp

A federal water policy would ideally consist of a set of goals and objectives based on sound environmental, social and economic principles and through negotiation with the provinces, implementation would be characterized by bilateral programs. Some of the broader issues to be considered in addressing water policy include water pricing to strengthen water conservation, need for improved irrigation systems to combat the greenhouse effect, and demand reduction management in the United States with Canada convincing the United States that it must solve its own water shortage problems. It is concluded that the International Boundary Waters Treaty be amended to incorporate joint research, regulation and action; the governments of Canada and the United States examine long-term issues of water and climate; the Canadian Council of Resource Ministers and Interdepartmental Committee be strengthened to provide coordination; and the Inquiry's recommendations be reviewed by the Canadian public. A corresponding transcript of hearings in Toronto addressing this submission is outlined.

274 (073525)
STOP * ***Current concerns about water quality in the Montreal region and suggested action for the Federal Government*** * In: Inquiry on Federal Water Policy : Montreal, Quebec, November 5-6, 1984 * Nov 1984 * vp

The citizens group STOP discusses current water issues which concern Montreal citizens and suggests some new remedies for consideration. Recommendations for federal government attention are presented. These include establishing standards for sewage treatment effluents such as the Montreal Urban Community sewer outfall; encouraging municipalities to plan sewage treatment more effectively and not use combined storm/sanitary sewers; controlling quality of industrial effluents; increasing water rates; and developing and supporting projects which emphasize the recreational use of water in Montreal. A corresponding transcript of hearings in Montreal addressing this submission is attached. Areas explored are storm water pollution, waste discharge levy, and needed active participation by the federal government in water quality control.

275 (073390)
TEMPLETON, C.H. * ***Submission to the Inquiry on Federal Water Policy by C.H. Templeton*** * In: Inquiry on Federal Water Policy : Victoria, British Columbia, November 26, 1984 * Nov 1984 * vp

Need for an overall management strategy or master plan for the conservation, development, use and enjoyment of water resources now and in the future in British Columbia is stressed. It is recommended that an independent commission could, with individual and government participation, set up a national library of water information and opinions, conduct workshops on estimating water management needs and develop a master plan. This commission should be independent of provincial or federal government control; direct itself to producing and getting consensus for a management master plan; be funded but not controlled by the federal government; and should be ended when the management master plan is produced. Attached is the corresponding transcript of hearings in Victoria addressing this submission which explores enforcement and regulation versus management of water resources, the commission as a federal or joint initiative, and the need for federal government presence in water management.

276 (073503)
THOMPSON, D. * ***Brief of Mr. Dixon Thompson to the Inquiry on Federal Water Policy*** * In: Inquiry on Federal Water Policy : Calgary, Alberta, October 9 and 10, 1984 * Oct 1984 * vp

Ten water management issues and recommendations are described with the focus on those aspects which are felt to be pertinent to federal policies. These include management of renewable resources; per unit pricing; water conservation; water-related technologies; effluent irrigation; water export; species transfers (transfaunations); a safe drinking water act; water quality enforcement; and anthropocentric (human-centred) approaches to water issues. A corresponding transcript of hearings in Calgary addressing this submission is attached.

277 (073405)
TOWN OF SELKIRK * ***Brief of the Town of Selkirk, Manitoba to the Inquiry on Federal Water Policy*** * In: Inquiry on Federal Water Policy : Winnipeg, Manitoba, October 24, 1984 * 1984? * vp

Deteriorating water quality in the Red River, Manitoba, originating from waste disposal by the city of Winnipeg is affecting the secondary water supply for the town of Selkirk. This brief submission cites the trial program of effluent disinfection at the South End Water Pollution Control Facility as an example where no action has been taken although the water quality problems are well known. It is felt that the federal government should help fund water pollution control projects; a detailed water quality inventory dealing with health-related contaminants should be maintained and updated; improved treatment for effluents discharged to receiving streams should be instituted; hazardous waste handling facilities should be constructed; and compliance legislation should be implemented. A corresponding transcript of hearings in Winnipeg addressing this submission is attached.

278 (073319)
TRANSPORT CANADA * ***Transport Canada's brief to the Inquiry of Federal Water Policy (sic)*** * In: Inquiry on Federal Water Policy : Ottawa, Ontario, December 3-10, 1984 * Dec 1984 * vp

Transport Canada's organizational components and general responsibility for various acts and regulations governing the uses of water transport are outlined. This brief focuses on the pollution prevention regime and the Coast Guard's plans for participation in the new international conventions on prevention of

pollution from ships. A review of the various areas of departmental interest concerning related water quality matters is presented. General issues discussed are measures for the prevention and control of water pollution; pollution from shipping; dredging and dumping of dredged material; marine transport of dangerous goods; ice-breaking activities for flood prevention; and export of water by ship tankers. What constitutes an acceptable level of pollution which does not menace the quality of life and its natural existence is still unanswered. The corresponding transcript of the hearings in Ottawa addressing this submission is attached.

279 (073340)
TRIVETT, L.S. * ***Brief submitted to Inquiry on Federal Water Policy : submitted by Wilfrid L.S. Trivett*** * In: Inquiry on Federal Water Policy : Ottawa, Ontario, December 3-10, 1984 * Dec 1984 * vp

This brief is presented on behalf of a farmer in Rama Township, Ontario. His concern springs from the reverse water flow in his tile drainage from the flooding of Lake St John by Parks Canada. Control techniques are suggested for both flooding and water pollution. Dams are suggested as a control technique for flooding and control of water enrichment from manure piles and fertilizers as a pollution control strategy. Included with the submission is a copy of a brief to the Government of Ontario Flood Plain Committee by the Township of Rama. The corresponding transcript of the hearings in Ottawa addressing this submission is attached.

280 (073569)
TROUT UNLIMITED OF CANADA * ***Brief to the Inquiry on Federal Water Policy : Trout Unlimited of Canada*** * In: Inquiry on Federal Water Policy : Toronto, Ontario, October 31st to November 2, 1984 * 03 Oct 1984 * vp

Trout Unlimited urges the Inquiry to realize that only overall watershed/basin management plans will ultimately meet the demand of Canadians for abundant clean water. Integrated management of land use activity at the watershed or basin level will protect trout species and habitat. This approach to demand management necessarily encompasses the maintenance of water quality and quantity for a multitude of other uses including human consumption. Each properly implemented watershed/basin management plan must recognize and sustain the critical requirements of instream and offstream, consumptive and non-consumptive users. Detailed discussions are presented on the multiple use of water, the designation system of headwaters protection on major rivers, water quality, the user-pay concept and a unified water policy. It is concluded that a federal water policy encompassing all aspects of the actions/reactions of water to its basin or watershed is necessary to encourage support and guide provincial policies. A corresponding transcript of hearings in Toronto addressing this submission is attached.

281 (073371)
UNION OF BC INDIAN CHIEFS * ***Union of B.C. Indian Chiefs submission to the Inquiry on Federal Water Policy*** * In: Inquiry on Federal Water Policy : Vancouver, British Columbia, November 19-23, 1984 * Nov 1984 * vp

This submission concentrates on Indian rights with respect to Canada, British Columbia and Indian nations jurisdictions in water management. The basis of aboriginal rights is traced focusing on the view that a right to water is a right to live. Coexistence is urged as a practical solution to environmental protection, conservation and management. Cooperation between federal, provincial and Indian governments or groups in these areas is essential. A review of Canada's and British Columbia's assumed jurisdiction over water in the province is presented. Supporting documents include historical data on water rights of Indians in British Columbia, aboriginal rights position paper and Indian government manifesto. A corresponding transcript of hearings in Vancouver addressing this submission is attached.

282 (073422)
UNION OF NEW BRUNSWICK INDIANS * ***Brief presentation to Federal Inquiry on Water Policy by Union of New Brunswick Indians*** * In: Inquiry on Federal Water Policy : Fredericton, New Brunswick, September 20, 1984 * Sept 1984 * vp

Problems of water supply, sewer conditions and pollution, shoreline erosion and lack of public wharves on Indian reserves in New Brunswick are detailed in this submission. It is recommended that there be training of Band members to properly maintain existing sewer systems; more frequency water testing; more adequate quantity of water supply; more information on pollution to Reserve residents; and more swimming facilities constructed for the recreation and development of youth. A corresponding transcript of hearings in Fredericton addressing this submission is attached. Areas explored are the extent of Indian involvement in water resources management on Indian land, lack of federal support in granting licences to Indians for lobster and salmon harvesting and causes of water quality degradation.

283 (073555)
UNION OF ONTARIO INDIANS * ***Brief to the Inquiry on Federal Water Policy : Union of Ontario Indians*** * In: Inquiry on Federal Water Policy : Toronto, Ontario, October 31st to November 2, 1984 * Sept 1984 * vp

The importance of good water quality and the major sources of environmental contamination to the Anishinabek Indian communities are detailed. The lack of an effective federal government environmental policy, jurisdictional complications, and adequate government funding for the bands to accomplish an environmental intervention all add to the growing problem of water quality degradation. Exact geographic locations in the Anishinabek communities of water

pollution incidents are presented. Water quality patterns include marginally acceptable drinking water sources, poor quality swimming beaches and contaminated fish spawning beds. It is recommended that all proposed future developments have full participation of the Anishinabek communities; adequate resources be made available so that the bands can intervene in future proposals for development; public hearings on environmental pollution that affect federal reserves be facilitated; and a Canadian environmental mediation process for concerned parties be instituted. A corresponding transcript of hearings in Toronto addressing this submission is attached.

284 **(073342)**
UNITED STATES DEPARTMENT OF EXTERNAL AFFAIRS • ***Statement to the Inquiry on Federal Water Policy submitted by United States Transboundary Division, Department of External Affairs*** • In: Inquiry on Federal Water Policy : Ottawa, Ontario, December 3-10, 1984 • Dec 1984 • vp

On behalf of the Federal Department of External Affairs, this presentation outlines the legal and institutional arrangements now in place with the United States respecting those rivers, lakes and streams that form or cross paths at the Canada-United States border. Relevant elements of the Boundary Waters Treaty of 1909 are examined including the underlying concept of acceptance by both countries that each ought not to disregard the other country's interests when deciding on some action which could affect the other country; agreement not to cause injurious transboundary water pollution; and creation of the International Joint Commission. Any national water policy must address water quality, consumptive uses and diversions out of the Great Lakes. Joint consultation between Canada and the United States is necessary. International law guarantees Canada's rights, but bilateral cooperation and consultation is fundamental to protecting Canadian interest. The corresponding transcript of the hearings in Ottawa addressing this submission is attached.

285 **(073567)**
WALPOLE ISLAND BAND COUNCIL • ***An address to the Inquiry on Federal Water Policy by the Walpole Island Band Council*** • In: Inquiry on Federal Water Policy : Toronto, Ontario, October 31st to November 2, 1984 • 01 Nov 1984 • vp

Concerns of the Walpole Island Indian Band in southwestern Ontario are outlined. They include the right to good quality drinking water and the continuing pollution of their main source, the St Clair River; dumping of wastes from commercial and pleasure vessels; winter navigation; shoreline erosion; lowering of river levels; user pressure on external environmental impact on wetlands and natural spawning grounds; and industrial development and expansion. A local environmental protection initiative, NINDAWAABJIG, includes building a data bank for sound resource management decisions. A corresponding transcript of hearings in Toronto addressing this submission is attached. Areas explored are interjurisdictional problems and communication with appropriate bodies.

286 **(073500)**
WATERTON BIOSPHERE RESERVE MANAGEMENT COMMITTEE • ***Paper presented to the Inquiry on Federal Water Policy for the Waterton Biosphere Reserve Management Committee*** • In: Inquiry on Federal Water Policy : Calgary, Alberta, October 9 & 10, 1984 • Oct 1984 • vp

The Waterton Biosphere Reserve Management Committee is concerned that water shortages in the national park areas and the Oldman River Basin will increase and lead to more unrest before proper management procedures are in place. Integration of land and resource use planning and programs in water management is necessary. It is also recommended that there be more public information about water problems and that some measure of responsibility is linked to permission to use water, including better management of irrigation schemes to encourage wise use of water. The federal government must work closely with provincial and territorial governments to encourage actions to counter increasing water quantity and quality problems. A corresponding transcript of hearings in Calgary addressing this submission is attached. Areas explored are water use planning in the Waterton area, activities and operations of the Committee, and the need for increased public awareness.

287 **(073378)**
WEST KOOTENAY POWER AND LIGHT COMPANY LIMITED • ***Brief of West Kootenay Power and Light Company, Limited to the Inquiry on Federal Water Policy*** • In: Inquiry on Federal Water Policy : Kelowna, British Columbia, November 28, 1984 • 1984? • vp

This submission states that hydroelectric generation should retain a high priority in the use of water. Given the pervasive use of electrical power throughout the Canadian economy, any change in existing policy on hydroelectric generation which adversely affects the electrical industry must be carefully considered. Any new policy direction could have serious negative effects on the financial viability of a utility. Reduction in hydroelectric generation would be made up through constructing additional hydroelectric facilities or from new thermally generated sources with the consequent adverse environmental impact. A corresponding transcript of hearings in Kelowna addressing this submission is attached. Areas explored are the environmental impact of hydroelectric generation, participation by the West Kootenay Power and Light Company in the Creston Valley Wildlife Management Area, and water pricing.

288 **(073315)**
WILKINSON, T.P. • ***Brief presented to the Inquiry on Federal Water Policy by T.P. Wilkinson*** • In: Inquiry on Federal Water Policy : Ottawa, Ontario, December 3-10, 1984 • Dec 1984 • vp

This brief is organized into three parts. Firstly, a set of premises is presented to provide a growth/use oriented context and resource ethic for opinions and suggestions contained in parts 2 and 3. Secondly, opinions are presented on issues raised directly in the participation paper from the Inquiry which generally reflect an argument for greater data collection to minimize impacts resulting from increased use. Thirdly, a review and argument for more attention to be paid to basin modelling is outlined taking into account the role of organic terrain and wetlands in the hydrologic cycle. Research needs in the geotechnical sciences are described focusing mainly on peatlands. The corresponding transcript of the hearings in Ottawa addressing this submission is attached. The presenter stresses in his responses that there is need for more research and more information and suggests ways to organize the research effort whatever the level of funding.

289 (073510)
WILLIAMS, C.M. * ***Brief prepared for the Inquiry on Federal Water Policy by C.M. Williams*** * In: Inquiry on Federal Water Policy : Saskatoon, Saskatchewan, October 23, 1984 * Sept 1984 * vp

This personal submission underlines the significance of water to prairie agriculture, discusses the strong relationship between the development of agriculture and the policies of governments and stresses the need to plan now for the use and protection of water on the prairies. Attention is directed to the stored water in the root zone of the prairie soils and the deeper aquifers that underlie the area, use of irrigation water and water quality. It is recommended that the needs of a region should be established first in terms of a water budget, the alternatives for meeting these needs investigated and the impact of each proposal presented studied. The significance of water requirements of crops and herds and the efficiency of water use on the prairies must be examined in any water strategy. A corresponding transcript of hearings in Saskatoon addressing this submission is attached. Areas explored are environmental aspects of herbicides, land management and conservation, poor quality of certain underground waters, irrigation projects and federal policy and agriculture.

290 (073395)
YUKON ASSOCIATION OF WILDERNESS GUIDES * ***Yukon Association of Wilderness Guides : presentation to Inquiry on Federal Water Policy*** * In: Inquiry on Federal Water Policy : Whitehorse, Yukon, October 15, 1984 * Oct 1984 * vp

This brief submitted by affiliated wilderness guides focuses on the Yukon's undisturbed natural environment, particularly its waterways and river valleys, as the main attraction for the growing industry of rafting and wilderness tours. It recommends that any future water policy for this area should take this into account. Attached is a corresponding transcript of hearings in Whitehorse addressing this submission which explores the need for protection of the quality of recreational and wilderness experiences in the Yukon.

291 (073394)
YUKON CONSERVATION SOCIETY * ***Presentation of the Yukon Conservation Society to the Advisory Committee on Federal Water Strategies*** * In: Inquiry on Federal Water Policy : Whitehorse, Yukon, October 15, 1984 * Oct 1984 * vp

This submission contains a description of the Yukon Conservation Society and its concerns, terms of reference of the Inquiry and the Society's philosophical framework on federal water strategies. Special Yukon considerations include interbasin transfer, water export and conservation, transboundary concerns including Yukon/British Columbia and Yukon/Alaska, long-term abandonment of industrial wastes, Yukon placer mining industry, water planning and management, energy planning, and public participation in water planning. Twenty-three recommendations are made on required elements of a federal water policy. Basically it should ensure full protection of the ecosystem, weigh social, cultural and economic aspects of resource inter-use, maintain ongoing standards of both quality and quantity, and maintain and enhance the integrity of the ecosystems. A corresponding transcript of hearings in Whitehorse addressing this submission is attached. Areas explored are the need for strategic water planning, long-term waste disposal and land use planning.

4.5 Briefs not presented at the hearings / Mémoires non présentés lors des audiences

292 (074633)
ABRAHAMS, B. * ***Water : a vital resource, too precious to sell*** * 09 Sept 1984 * 13p

Water export and/or diversion to the United States is strongly opposed as being another way to gain control of Canada and its resources by the United States. A history of Canadian economic dependence on France, England and more recently the United States is presented. Water is seen as the last resource available in Canada that is not foreign-owned or foreign-controlled, and there is a strong plea that it remain so. There is a growing water shortage in the western and midwestern United States, and Canada is the closest neighbour with an abundant supply of this resource (14% of the world's fresh water). Water diversion plans including North American Water and Power Alliance (NAWAPA) to dam the Yukon and Tanana rivers and the James Bay Damming Plan are discussed. It is concluded that Canada needs to fiercely protect its water resources not only for future generations but to maintain the delicate ecological balance which will ultimately be destroyed if water quantity and quality are compromised.

293 (074611)
ADAMACHE, L.N. * ***Submission to Inquiry on Federal Water Policy by L.N. Adamache*** * Nov 1984 * 15p

This submission describes the need for integration of science into environmental regulation, the National Water Research Institute in British Columbia, and the role of Environment Canada in water management. The need for technical upgrading of the regulatory community and for research concentrating on environmental effects of cultural activities to improve environmental decision-making are detailed. It is suggested that many of the technical staff in British Columbia involved in regulatory activities in all levels of government do not have an adequate knowledge base to support their bureaucratic function. The proposed move of the National Water Research Institute from West Vancouver to Saskatoon is opposed because the team of scientists has developed an invaluable expertise and knowledge of British Columbia freshwater bodies. The federal government has a legitimate role to play in such areas as administration of international agreements, sponsoring research, developing water and air quality criteria, and providing the provinces and industry with the tools for better environmental management. Only one government agency should have primary responsibility for water resource policy and for regulating water use. The provinces should be responsible for their own water resources management on a river-basin or site-specific basis.

294 (074625)
AGRICULTURAL INSTITUTE OF CANADA * ***Water use in Canadian agriculture : report of the Task Force on Water Use in Agriculture*** * 13 Mar 1985 * 13p

The Task Force on Water Use in Agriculture identifies the three major water problems facing agriculture as regional moisture adequacy, drainage, and irrigation. It is stressed that water policy cannot be divorced from overall Canadian economic development strategy, especially that relating to agriculture, industry and energy development, and that the federal government must play a leading role in initiating and coordinating such strategy. Recommendations include research and policies to deal with improving water use efficiency and increasing the intensity of cropping in existing irrigation systems; new water rights systems and waste pricing are needed to ensure water availability for higher valued uses during times of scarcity; improved methods of moisture conservation and snow management should be included in researching agronomic and economic details of dry land cropping systems; the federal government must improve institutional structures and policy to deal with water quality and toxicity problems in the Great Lakes; serious deficiencies should be corrected with respect to scientific manpower and research resources devoted to agricultural water uses; and data should be collected on land drainage extent.

295 (074627)
AGRICULTURE CANADA, CANADIAN FORESTRY SERVICE * ***Submission of the Canadian Forestry Service, Agriculture Canada*** * Feb 1985 * 9p

The intimate linking between water and forests, the issues that emerge from this linkage, and current federal programs on these issues as conducted by the Canadian Forestry Service are explored. Aspects of the impact issue are examined in detail including impacts of forest management on water quality and quantity, water-related issues from the perspective of the forest sector and major environmental issues facing both water and forestry. Forestry practice is seen to impact on the areas of water supply, fisheries and flooding. Water management has little or no impact on forest resources except loss of forest land resulting from hydroelectric reservoirs. The major environmental issues of water and forestry are acid precipitation and carbon dioxide, or the greenhouse effect, which could cause a massive disruption in the adaptiveness of Canadian forests to their environment. The role of the federal government in resource management is to provide national leadership, a nationwide program of research and development supporting all aspects of forest management, and to assist the provinces in accomplishing renewal of forests through federal/provincial forestry development agreements. Through the Canadian Forestry Service, the federal government intervenes in forest management. Conclusions include the need for a new holistic philosophy in which demand and supply are subject to integrated national policies, the need for natural resources to recognize the existence of other resources, and the need for management to be conducted on a sound ecological framework.

296 (074609)
ALBERTA WATER WELL DRILLING ASSOCIATION * ***Submission of the Alberta Water Well Drilling Association*** * 29 Oct 1984 * 3p

This submission outlines three areas of importance to the Alberta Water Well Drilling Association: ground water should receive resource classification and have programs related to management and utilization; uniformity of groundwater regulations in all provinces is necessary if ground water is considered a resource; and groundwater education and promotion of country-wide training programs or reciprocal programs and competency levels between provinces should exist to make the public more aware of the importance of groundwater quality.

297 (074645)
ALCHEM INC. * ***Submission of Alchem Inc.*** * 06 June 1984 * 2p

This submission requests that the federal government reinstate the review system of chemicals intended for treatment of potable water. Without this government sanction, municipalities and others treating potable water are hesitant to consider new products. This is also of concern to Canadians wanting assurance

that their drinking water is safe and also to responsible corporations who want to be certain that their products are safe. It is felt that the federal government under the auspices of Health and Welfare Canada should do the review to avoid complexities of ten sets of provincial regulations and guidelines.

298 (074622)
AMALGAMATED CONSERVATION SOCIETY * ***Submission to the Inquiry on Federal Water Policy*** * Jan 1985 * 4p

Deteriorating water quality on Vancouver Island and its adverse effects on fish and wildlife habitats are addressed in this submission. It is recommended that a national, coherent, cooperative approach to water management be developed; water management be done on a basin-by-basin basis; the greenhouse effect be considered in present and future water management policies; the terms of reference of the Inquiry should go further than federal water policy and address federal/provincial jurisdictional concerns; the Canada Water Act should be implemented to develop federal/provincial water management schemes so that people, fish and wildlife can be assured of a clean and abundant water supply.

299 (074618)
ASSOCIATION OF CONSERVATION AUTHORITIES OF ONTARIO * ***Association of Conservation Authorities of Ontario : brief to the Inquiry on Federal Water Policy*** * Dec 1984 * 3p

Ontario's 39 conservation authorities with primary responsibility for flood and erosion control and flood plain management wish to see the following issues addressed by the Inquiry: watershed as the management unit; wetlands; flood plain management; structural impediments to water management; water quality, particularly non-point source pollution; and public awareness. In all of these issues, the federal government must be responsible for coordination of water management research, resolution of interprovincial for international issues, and coordination of development of intergovernmental policy.

300 (074595)
ATHABASCA CHIPEWYAN INDIAN BAND * ***Inquiry on Federal Water Policy submission by Athabasca Chipewyan Indian Band*** * 23 Aug 1984 * 22p

Development of a national water policy could provide a framework within which regional water problems could be addressed by both federal and provincial agencies. The Athabasca Chipewyan Indian Band centered in Fort Chipewyan is particularly concerned with the quality and quantity of river flows into Lake Athabasca and the Peace-Athabasca Delta. Results of three major studies (Peace-Athabasca Delta, Mackenzie River Basin, and Slave River Hydro Feasibility) affecting the Fort Chipewyan region are cited to illustrate the importance of drainages which affect the water levels and resources of the Lake Athabasca/Peace-Athabasca Delta region. Conclusions presented include lack of national or regional policy for the protection and/or management of water and aquatic resources in this region; need for a regional policy incorporating a fully integrated approach which recognizes that aquatic renewable resources need protection; the vulnerability of marshlands and of downstream residents to pollution from upstream; need to apply the law to industry polluters; need for the federal government to foster research in water resources allocation; and need for public participation.

301 (074631)
BAYLY, J.U.; HUBERT, B.A. * ***Submission to Pearse Water Inquiry*** * 16 Oct 1984 * 7p

If a constitutional amendment to reaffirm, that management of waters is a federal responsibility, is not accepted by the requisite seven provinces, other things that the Government of Canada can do through its water management policy and within its presently recognized jurisdiction to affect water management decisions are examined. Canada can set an example for judicious water management through its use of the Northern Inland Waters Act and better direction for the quasi-judicial board to provide for optimum conservation, use and development of water resources. The Northern Inland Waters Act and its regulations could be reviewed and, although flawed, this model could serve as the basis for the design of interjurisdictional water boards with authority for limited planning and total management of a watershed's water resources. The way in which the Canadian government administers water use in northern Canada is held as an example of good water management with a need for the water board to be more effective in areas of water use planning, water quality standards and enforcement of its terms and conditions.

302 (F13166)
BERNIARD, M. * ***La gestion des nappes d'eau souterraines pour la production agricole*** * janv 1985 * pd

Ce rapport met en évidence l'importance de l'eau souterraine en tant que richesse naturelle à préserver. L'auteur commence par décrire les différentes eaux souterraines (météoriques, régénérées, juvéniles), ainsi que le cycle de l'eau. Les nappes sont définies, classifiées, et on décrit leur alimentation - renouvellement. Les besoins en eau pour l'agriculture ainsi que l'influence des cultures sur les nappes souterraines sont discutés. Enfin, les conséquences du puisage sont mises en évidence. En conclusion, l'auteur insiste sur le droit à l'eau pure et incite le gouvernement à prendre des mesures afin de protéger cette richesse naturelle.

303 (074626)
BOCKING, R.C. * ***Canadian water - a commodity for export?*** * 1984? * 56p

This extensive submission stresses that there is no shortage of water now or in the future in the United States that would require the export of Canadian water for its resolution. There exists a wide range of

strategies enabling areas perceived to be suffering from insufficient water to cope with their problems without seeking water from other basins. Extravagant waste because water is sold at very low subsidized prices is basic to most United States water problems. Prices closer to real cost would greatly change consumption patterns. The economic, social and environmental cost to Canada of even relatively small-scale exports of water to the United States would be very great. Many of the serious repercussions are not predictable. Any proposals for export that have been advanced have not considered the contributions that natural river flows make to the biological productivity of oceans and to global climatic balance. Policy suggestions that Canada determine how much water might be surplus to future Canadian needs are useless. Too many unknowns are involved to make projections of this kind of any use in the development of water policy development.

304 (074644)
BOERMA, H. • ***Notes submitted to Inquiry on Federal Water Policy*** • 11 Jan 1985 • 4p

Suggestions on what the federal Inquiry on Water Policy should consider in its report are presented. These include counteracting negative consequences of major deficiencies of Canada's current system of resource exploitation; studying ecological consequences of water-related developments; promoting more efficient water use and reduction of consumption; water pricing; more sophisticated water demand management tools; and more cost-effective solutions to water management problems. Saskatchewan-specific concerns are also highlighted. Suggestions made include developing ways for the Prairie provinces to live with natural water flows available there; adding Churchill River as a heritage river; and ensuring that no federal financial contributions be made to projects requiring permanent removal of water from the Saskatchewan River system. Other concerns discussed are providing incentives to municipalities for increased water pollution control, replacing chlorine with ozone for treatment of drinking water supplies and eliminating underground disposal of hazardous liquid wastes.

305 (074603)
BUCK CREEK RESIDENTS ASSOCIATION • ***History and evaluation of the environmental consequences of the operations at Equity Silver Mines, Houston, British Columbia*** • Oct 1984 • 14p

Concerns of the residents and landowners along Buck Creek near Houston, British Columbia, with respect to the water quality degradation of Buck Creek, their main source of water supply, by Equity Silver Mines are detailed. The main concerns are acid mine drainage; permitted effluent discharge of certain volumes and concentrations of liquid pollution into a watershed; failure of present reclamation techniques to prevent the acid mine drainage reaction; development of new technologies for successful reclamation of these mining sites; social and legal accountability by polluting companies; and transportation by railway or truck of hazardous chemicals used in the mining industry. Several letters of concern are included with this submission. Of particular concern is the amendment to the company's waste management permit to allow discharge of cyanide into the watershed through Bessemer Creek.

306 (074605)
BUDDING, U. • ***Submission of Ursula Budding*** • 05 Nov 1984 • 5p

This personal submission outlines the frustration faced by a rural resident in Stamp Falls, British Columbia, who sees her water supply from a creek being eroded by agricultural wastes from nearby farms. A water quality law is urged so that every citizen is entitled to clean, pure water. Basic regulations for achieving water quality are outlined for municipalities (sewage, garbage dumps and drinking water supply), industry and business, agriculture (plants and animals), and private individuals. Hefty fines should be levied as a deterrent to pollution. Examples are cited to show how the British Columbia government's basic requirements to satisfy statutes and safe use of pesticides are not being followed. The bureaucratic jungle that a resident faces when trying to find answers is also examined.

307 (074602)
CANADIAN ELECTRICAL ASSOCIATION • ***Submission of the Canadian Electrical Association*** • 15 Oct 1984 • 3p

The position of the Canadian Electrical Association with respect to water policy is that a multiple-use approach to water planning is essential and that electrical generation can and does coexist well with other uses for Canada's water resources. Water is considered absolutely essential to electrical production through hydroelectric, conventional thermal, and nuclear generation. Only a very small proportion of water withdrawn for thermal generation is actually consumed. The balance is returned to its source in the same form and condition as before with a little heat added. Hydroelectric generation is an instream use of water and does not alter the quantity or availability of the water for other uses. The Association requests that the consultation and cooperation of the electrical utility industry be solicited for any proposed changes in current water use policies.

308 (074617)
CANADIAN FEDERATION OF AGRICULTURE • ***Submission to the Inquiry on Federal Water Policy by the Canadian Federation of Agriculture*** • 18 Dec 1984 • 3p

Management of the water supply for agriculture calls for coordination in two distinct ways. Coordination is required between the various federal, provincial and municipal jurisdictions and the private sector as well as clarification of jurisdictional authority. Water management for agriculture must be considered in association with soil management and the atmosphere's

influence in the form of climate and weather. The extent to which agricultural production is dependent on sufficient water supply is described. Cost-benefit analysis of irrigation development must take into account the full range of benefits to the public. Other water problems common to farmers include excess water and land drainage, effects of pesticides and fertilizers on water quality, and reduced precipitation from a climate warming trend. The opposition to water export to the United States is based on the climate warming trend and the increasing dryness. Farmers have a strong economic incentive to restrict the movement of chemicals from their soils into water courses and are equally concerned about the continuing water quantity/quality trend.

309 (074600)
CANADIAN SOCIETY OF ENVIRONMENTAL BIOLOGISTS, ALBERTA CHAPTER * ***Submission of the Canadian Society of Environmental Biologists, Alberta Chapter*** * 12 Oct 1984 * 5p

Several activities in Alberta are affecting the fisheries, waterfowl and other migratory bird habitat. These include disturbance of streams and rivers through resource development, diversions and dams, and drainage and other agricultural impacts. These land use activities and direct alterations of water courses have profoundly affected the productivity of the waterbodies by altering streamflow characteristics, water levels and water quality. It is recommended that the federal government incorporate habitat enhancement schemes in development plans affecting water bodies; assume a stronger role in monitoring chemical and sediment loads; establish guidelines for minimum streamflow, chemical effluents and sediment loads; encourage evaluation of a no-development alternative in environmental impact assessments affecting water bodies; encourage an integrated water-basin approach to development planning; and support educational programs and information dissemination on the ecological effects of diversions, impoundments, and interbasin transfers.

310 (074616)
CENTRAL INTERIOR STEELHEADERS ASSOCIATION * ***A brief to the Inquiry on Federal Water Policy on behalf of the Central Interior Steelheaders Association*** * Oct 1984 * 7p

The question of quality water must take precedence over quantity or the availability of water. The declining water quality in the Thompson River, British Columbia, is seriously affecting sport fishing and destroying invertebrate life. Causes are most often logging, mining, acid rain and general industrial growth. Recommendations are made to correct the situation. These include establishing a simple index of water quality to determine the extent of pollution in a water body; extracting hefty concessions to reduce acid rain in return for water export to the United States; encourage public education; reach even small abusers and adopt the abuser should pay concept; adopt a new system of laws with a higher court or tribunal to ensure that differences over water issues be resolved by a judicial or quasi-judicial process.

311 (074643)
CITY OF SASKATOON * ***Submission of the city of Saskatoon*** * 13 Dec 1984 * 3p

The city of Saskatoon presents its views on various issues raised by the Inquiry on Federal Water Policy. The city feels that the federal government should be involved in the regulations of interprovincial waters; the previous CMHC program for trunk outfall sewers and sewage treatment be reinstated; interbasin transfers are not advisable; the federal drinking water standards should be advisory since each province has a different situation with respect to groundwater quality; the federal government should monitor interprovincial water especially for organic chemicals which are expensive to measure; the federal government should be the most qualified technical advisor to both the provinces and cities; and a study should be undertaken with respect to the institution of a charge for water usage.

312 (074607)
DALE, D.I. * ***A submission to the Inquiry on Federal Water Policy on the topic of freshwater sediment issues in Canada*** * Nov 1984 * 4p

This submission addresses the need for increased support for the freshwater sediment program in Canada. It is suggested that the Sediment Survey Section of the Water Survey of Canada, Inland Waters Directorate, could provide the home for a specialized group providing technical expertise and continuity over time on the movement of sediment from the land to the stream. Under the present program, only minimal funding is available for scientific studies related to the interaction of water and sediment. One way in which the situation can be improved is to establish a Centre of Excellence where a team of scientists and engineers could address the many technical problems related to freshwater sediment issues, establish standard approaches to the solution of freshwater sediment problems in Canada and provide direction to the various provincial and federal government departments which deal with freshwater sediment issues.

313 (074597)
DEFINE DESIGN LTD. * ***A new look at climate, the greenhouse effect, and their influence upon the future*** * 1984 * 21p

Basic assumptions regarding the distribution of carbon dioxide and the greenhouse effect are questioned. The interrelationships of carbon dioxide, temperature and precipitation are explained using specific examples. The range and distribution of the greenhouse effect throughout the world indicate a range from 2°C at the equator to some 7°C at the poles. Mechanisms known to influence the greenhouse effect from carbon dioxide include volcanic activity, life, greenery, oceans and ice, combustion, and modern warfare. Observations on the timing of greenhouse effects are made with predictions for several areas in the world. Suggestions on how to

deal with the greenhouse effect include more research; increased production of food by mitigating the effects of climate; better use of water for irrigation; institution of new forms of transport and transhipment; reconsideration of priorities of energy sources; better ecological management; and improved use of space, structure and cities.

314 (074636)
DEVONIAN GROUP OF CHARITABLE FOUNDATIONS * ***Proposal to establish a western-based research and public information water institute "The Aquarius Council"*** * 1983 * 26p

The principal impediments to responsible water resources development contingent upon enhanced water use in western and northern Canada are seen as jurisdictional disagreements, public opposition and possible conflicts with other resource priorities. The water issues of regulation, planning, water use, and public concern can be addressed through a western-based research and public information water institute in close consultation with resource managers and the public. The geographic scope of this Aquarius Council would be all fresh waters in the region where Canadian rivers flow to the Arctic Ocean, the Pacific Ocean, the Gulf of Mexico and the western Hudson Bay. This proposal calls for total financial contributions of $5 million from seven governments, industries and the Devonian Group of Charitable Foundations. This latter will fund the preliminary phase and will commit funds for the Council's start-up years. A detailed description of the Council includes start-up, structure, mandate, activities including engendering public involvement, establishing a library and undertaking research and investigation, and both funding and financial requirements

315 (074646)
DOMINION MARINE ASSOCIATION * ***Submission of Dominion Marine Association*** * 11 July 1984 * 16p

Concerns of shipowners using the Welland Canal and the Montreal-Lake Ontario section of the Seaway are briefly outlined in a letter to the Inquiry and explained in greater detail in a presentation made to the Ontario Water Resources Conference in Toronto, June 1984. Shipowners are concerned with the quality and quantity of water in navigable waterways and are especially concerned that even a marginal drop in water levels in the Seaway waterways could eliminate as much as one million tonnes of cargo in a navigation season. All ships operating in the waterway now have sewage treatment plants or holding tanks for wastewater and are conscious of the heavy penalties handed out for any infractions. A description of new types of ships for transporting and unloading is presented. The St Lawrence/Great Lakes system can be expanded at minimum costs and disruption to accommodate greater usage as both Canada and the United States develop.

316 (074635)
DRINKWATER, K.F. * ***Effects of river runoff on the marine environment off eastern Canada*** * 1984? * 10p

This submission describes the geographic extent over which freshwater effects are felt in the coastal marine areas off eastern Canada and indicates the possible relationship between freshwater runoff and fish production. Investigations focus on St Margaret's Bay which is a small embayment along the Atlantic coast of Nova Scotia, the Gulf of St Lawrence, the Gulf of Maine, the Labrador Shelf and Grand Banks. Statistically significant relationships between fish and runoff are established by correlation techniques. A conservative and rigorous test for significance was derived which took into account the marked persistence in the data. It is concluded that when considering Canada's freshwater resources and possible modifications, it must be understood that fresh water entering the sea alters the marine environment in the immediate vicinity and for months at downstream distances on a scale of 1000-2000 km, and that striking correlations exist between river discharge and subsequent commercial fish catch on Canada's major east coast fishing banks.

317 (074649)
ENVIRONMENT CANADA, CANADIAN WILDLIFE SERVICE, PRAIRIE MIGRATORY BIRD RESEARCH CENTRE * ***Submission of Prairie Migratory Bird Research Centre, Canadian Wildlife Service, Environment Canada*** * 29 Jan 1985 * 22p

Wetland complexes that provide for the entire life cycle of wildlife must be preserved to sustain this economic resource. Drainage of these wetlands eliminates all benefits to agriculture and society. Present land management practices promote the indiscriminate drainage of wetlands resulting in wetland destruction at a rate of 18% per year. During the past 15 years, mallard and Saskatchewan white-tailed deer herd have declined by 50%. Thus land management practices not only result in drainage but wetland margins are being greatly altered. The current water management policy and programs geared to facilitate drainage and reclaim lands for agricultural purposes does not consider the dependency of other important industries on soil and water resources. A water management approach that might be used by soil and water resources agencies to improve the utilization of Canada's shared resources and to establish a protocol for utilizing wetlands is presented.

318 (074614)
FEDERATION OF MOUNTAIN CLUBS OF BRITISH COLUMBIA * ***Submission to the Inquiry on Federal Water Policy from the Federation of Mountain Clubs of British Columbia*** * 01 Dec 1984 * 7p

The continuing undervaluation of nonindustrial, non-consumptive water uses is seen as the principal concern to consider in water allocation and management policy. This submission states that there

is an immediate need for recognition of recreation, tourism and wilderness values as resources in their own right; enhanced and better mechanisms for the preservation of these resources; protection of access to areas important for recreation and related activities; and sustained and improved government support for research and planning activities. A new form of protection for important river corridors should take the form of a conservation license to promote positive, active management of extensive recreation resources. The Canadian Heritage Rivers System should continue to be supported and promoted by the federal government, and British Columbia should join. Public participation and public education in river basin planning should also continue to receive government support. It is further recommended that intervenor funding be provided to relevant interest groups during reviews and decision-making processes with respect to water management.

319 (074624)
GOVERNMENT OF NEWFOUNDLAND AND LABRADOR, DEPARTMENT OF ENVIRONMENT * ***Provincial position paper on the federal role in water management submitted to the Inquiry on Federal Water Policy*** * Feb 1985 * 35p

The province of Newfoundland states its misgivings about the creation of the Inquiry on Federal Water Policy as it sees this as a unilateral move by the federal government to assume powers over water which are currently held by the provinces. This submission outlines the province's position on the role the federal government should play in exercising its responsibilities in the water area. Specifically, it addresses the avoidance of the Canadian Council of Resource and Environment ministers as a forum for debating water policy matters, the ineffectiveness and apparent indifference of the federal interdepartmental committee on water, the narrow focus of the federal Fisheries Act and the absence of any significant Inland Waters Directorate personnel in Newfoundland. All of these elements focus on the theme of cooperation and consultation among governments in the assessment of the federal role in water matters.

320 (074601)
INDIAN ASSOCIATION OF ALBERTA * ***Treaty 8 submission to Inquiry into Federal Water Policies (sic)*** * 12 Oct 1984 * 5p

The continuing deterioration of water so vital to the survival of the aboriginal people of Canada is underlined. The Indian belief, unlike the Judeo-Christian belief, is that man and nature are in harmony and that man has no right to alter or subdue the earth. The Indian people of northern Alberta are being threatened with the destruction of their primary independent means of subsistence without regard to treaty and aboriginal ownership rights. Specific concerns include the proposed Slave River dam; pollution of the Athabasca River and Lake Athabasca by the tar sands plants in Fort McMurray; pollution of the Wapiti River by Proctor and Gamble; permanent and recurrent damage to the Peace River as a result of Bennett Dam; the proposed hazardous waste disposal facility in Swan Hills; and provincial water diversion schemes.

321 (074639)
KELLAR, J. * ***Vancouver water : problems & solutions*** * 13 Nov 1984 * 2p

Vancouver's drinking water supply is soft, mineral free, has high lead concentration levels, leaches excessive amounts of copper and lead from copper pipes and asbestos from asbestos cement pipes, and has high turbidity levels which give rise to trihalomethanes which are carcinogenic. The problem of Vancouver's drinking water can be greatly reduced through the implementation of corrosion control and the installation of a filtration system, or use of a point-of-use device utilising reverse osmosis to solve the problem on an individual basis.

322 (074638)
KER, W.A. * ***Rehabilitation - municipal water & sewer systems*** * 23 Nov 1984 * 3p

The form of user tax based on consumption of water could be initiated in Canada to fund a rehabilitation program for municipal water and sewer systems. A user tax of $0.000132/litre/year would yield about $100 million. This amounts to $9.63/year for the average user assuming an average per capita daily consumption of 200L/day. It is suggested that the Federation of Canadian Municipalities could be approached to work out details on the method of collection and allotment of funds.

323 (074641)
LAKEFRONT OWNERS ASSOCIATION * ***Submission of Lakefront Owners Association*** * 14 Nov 1984 * vp

Concerns of the Lakefront Owners Association in the Borough of Etobicoke in Toronto, Ontario, are presented through several documents, including a submission to an environmental hearing of 1980, a first under the Ontario Provincial Environmental Assessment Act. Concerns expressed are primarily water quantity and diversions, stressing that riparian owners must have equal consideration with transportation and hydro interests; water quality, indicating that open lake landfills result in polluted embayments, loss of littoral zones and bird problems; and full cost-benefit assessments should be mandatory to ascertain if a work should be undertaken. Specific examples presented include the Metropolitan Toronto Waterfront Plan, which sanctions recreational parks created by landfill; Bois Smith Park proposal; and landfill effects on lake currents. The Association believes that there is need for a strong federal body that will take responsibility, set guidelines and ensure cooperation between all levels of waterfront authorities.

324 (074621)
LAYCOCK, A.H. * ***Brief of Dr. Arleigh H. Laycock*** * 30 Jan 1985 * 27p

The regional nature of many of Canada's water problems and issues is detailed. Some world and regional perspectives are presented to illustrate the resources Canada has relative to other parts of the world and the physical processes and geographical distribution patterns involved. The need for research to be regional to address the regional nature of water management issues is stressed. It is argued that the breadth needed for a national agency is lacking, and that provincial governments have become dominant in policy development. Research priorities and possible funding sources are presented. The major recommendation is that a nationwide, joint federal-provincial conservation and reclamation program for land and water resources be instituted. Elements to be included are flood damage reduction, irrigation drainage, erosion damage reduction, salinization reduction, wetland reclamation and preservation, watershed management, streamflow and streamside environment improvement, forest/woodland/grassland reclamation, mining and other use site reclamation, and water quality maintenance and improvement. A major federal-provincial research support program strongly involving the universities should also be instituted.

325 **(074647)**
NIAGARA PENINSULA CONSERVATION AUTHORITY * ***Water is a mainstream issue*** * 15 Oct 1984 * 2p

Comments and recommendations are made on the Inquiry's participation paper Water is a mainstream issue. These are: the federal government should continue to play a role in flood protection; the federal role in maintaining Great Lakes water quality and quantity should be reviewed and clarified; the federal government should assume a stronger role in water quality including a commitment to data collection and monitoring, initiation of liaison with international bodies to resolve joint problems and reconciliation of user conflicts, and a review of governmental control and regulations; the continuation of federal involvement is recommended not only to provide national data but also to provide conservation authorities with data for their flood forecasting system; and a better definition of the federal government's role in ensuring groundwater quality is needed.

326 **(074596)**
NORTH SALT SPRINGS WATERWORKS DISTRICT * ***Brief of North Salt Springs Waterworks District*** * 10 Oct 1984 * 4p

Water quality and quantity concerns on Salt Spring Island, British Columbia, are addressed. The increasing demands on the island's four major lakes are contributing to declining water quality and diminishing supplies, especially since the island lies within a rain shadow and as such receives less precipitation than other British Columbia coastal areas. Eutrophication, acid rain, waste disposal, and common chemicals pose serious threats to the island's water quality. It is expected that treatment costs will increase and public confidence in drinking water safety will erode. The multiple-use philosophy, which assumes a high level of knowledge about pollutants, is seen as untenable for many areas, including Salt Spring Island. Because of the multiplicity of government bodies responsible for various aspects of water quality or the lack of any government responsibility for some aspects of water quality on the island, this philosophy does not help in water quality improvement and does not seem to correct problems as they occur. It is imperative to clearly isolate sources of community water supply and perhaps provide assistance to communities to acquire land to help protect their water sources.

327 **(074650)**
ONTARIO FEDERATION OF AGRICULTURE * ***Submission of Ontario Federation of Agriculture*** * 20 Feb 1985 * 2p

The Ontario Federation of Agriculture outlines concerns that it hopes will be addressed in the Inquiry's deliberations and report. These include the federal role in interprovincial and international areas; realistic goals for agriculture advisory and educational conservation services; federal initiatives to assist local watershed authorities in developing water management plans; the need for users to have the opportunity to participate and cooperate in addressing problem areas; punitive, counterproductive demand restrictions should be replaced by conservation management practices; and water issues must be viewed in the context of quality rather than quantity. The approach to water management should provide education, guidelines and incentives followed by regulation to correct persistent problem areas.

328 **(074598)**
ONTARIO MINISTRY OF AGRICULTURE AND FOOD * ***OMAF submission : provincial response to the Inquiry into Federal Water Policy (sic)*** * 1984 * 15p

The water needs of the primary agricultural producer in Ontario are examined to illustrate that water use and its management are an integral part of a complex overall farm management process. Agricultural water sources, agricultural water needs including domestic, livestock and irrigation requirements, factors affecting future agricultural water needs in Ontario, agricultural runoff, watershed studies and agricultural non-point source control, cooperation between the federal government and Ontario Ministry of Agriculture and Food, and research and development are described. Rational ways to reduce water demands are economically necessary, and agriculture in Ontario has a responsibility to make its water uses as effective as possible. Enhanced conservation techniques and better crop management practices will preserve and improve the quantity and quality of Ontario's natural resource base.

329 **(074620)**
ONTARIO MINISTRY OF THE ENVIRONMENT * ***Submission to the Inquiry on Federal***

Water Policy by Ontario Ministry of the Environment * Jan 1985 * 9p

The province of Ontario believes it has attained a level of cooperative administrative practice with the federal government exemplified in the Canada-Ontario Agreement on Great Lakes Water Quality and the Accord on Environmental Protection. Taken together, the Agreement and the Accord comprise a strong framework for federal-provincial cooperation, and the province hopes to further strengthen this relationship through the amendment to the Canada-Ontario Agreement. It is hoped, among other things, that the Agreement will continue to provide for nearshore surveillance, especially in areas of concern identified by the International Joint Commission, and that federal funding for sewage works construction will continue. The need for strong provincial/state actions and cooperation in pollution control on the Great Lakes, the need for greater certainty in the federal relationship with the United States on environmental matters, and the need for the International Joint Commission to develop candid assessments of the nature and extent of Great Lakes pollution are outlined. The powers afforded Canada, by the agreement with the province of Ontario, should be recognized and employed to the fullest in conducting negotiations with the United States.

330 **(074628)**

POLICY ANALYSIS AND RESEARCH MANAGEMENT * ***Canada's water policy: a constitutional conundrum : a note to the Inquiry on Federal Water Policy on extension of the federal presence in water matters*** * May 1985 * 8p

The extension of the federal presence or a central legal authority on water matters is explored by examining certain points on the nature of law. The declaratory power of Parliament to bring into federal jurisdiction a local work deemed to be for the good of two or more provinces is examined in the face of provincial sensitivity about the federal role in water matters. Declaratory power is seen as being in conflict with the principles of federalism. The necessary national dimension when invoking the peace, order and good government clause of the Constitution Act is examined. Some additional constraints on the extension of federal power include constitutional authority to entertain disputes between provinces. The double aspect doctrine or the standard of equal importance appears to hold promise of securing a bias for the development of a general central presence in water matters. Ways in which the federal government should use spending power along with intergovernmental agreements to advance its role in water matters are described.

331 **(074651)**

QU'APPELLE VALLEY INDIAN DEVELOPMENT * ***Submission of the Qu'Appelle Valley Indian Development Authority*** * 30 Apr 1985 * 2p

Lack of legislation to clearly identify what Indian water rights are according to treaties with the federal government is seen in this letter as the main stumbling block to solving Indian water rights problems. Common frustration has led to the formation of the Prairie Indian Water Rights Council with the main members being the Dakota Ojibway Tribal Council of Manitoba, Qu'Appelle Valley Indian Development Authority of Saskatchewan, the Northern Flood Committee of Manitoba and the Pergan and Blackfoot of Alberta. With several provinces planning massive hydro projects near the northern communities, the Bands' concerns over their territory and their livelihood are real. They are anxious to see where treaty Indians are in the larger scheme of Canadian and provincial water issues.

332 **(074629)**

RED DEER REGIONAL PLANNING COMMISSION * ***Submission of the Red Deer Regional Planning Commission*** * 15 May 1985 * 9p

Concerns of the Red Deer Regional Planning Commission with respect to the South Saskatchewan River Basin in the areas of sub-basin apportionment allocation, irrigation bias, water use efficiency, and municipal and industrial needs are presented. In responding to three key policy issues of priority of water use, management and apportionment, the Commission advocates some basic management principles: a multipurpose planning approach be adopted for the use of water; more efficient use be made of existing water supplies; the benefits of water management be shared throughout the basin; and water be recognized as a limiting factor to growth. The basic water objective of the Commission is to ensure a sufficient and reliable supply of good quality water to meet the present and future needs of the region. Other related water management considerations include watershed management, groundwater use and management, wetlands, reservoir shore lands planning, retention of the river's character as part of the natural heritage, and integrated management and planning of the basin's water, land and other resources. The importance of public participation is underlined. This submission was intended for public hearings of the Alberta Water Resources Commission on the future use and management of water in the South Saskatchewan River Basin.

333 **(074604)**

RUTLEDGE, L. * ***Submission of Leo Rutledge*** * 01 Oct 1984 * 9p

The need for the federal government to take the lead in managing a mainstream issue like water is stressed. Such a lead involves informing the public in an easily understood and logical way of the need to preserve and protect Canada's water resources. Some concerns with water resources are examined in detail: the Government of Canada must investigate closely rationalizations of fervid water use proponents; decisions on water use must rest with value judgement and not only on economic cost-benefit analysis; water must be encouraged to stay where it falls, at source; sale of water to the United States should bear in mind the continental aspect of certain water issues; the federal

government must lead in issues of mainstream significance; industrial polluters must clean up their pollution; and preserving the integrity of a biotic community should determine the criteria needed to decide priorities among conflicting water use.

334 (074630)
RYAN, R. * ***Environmental problems surrounding a proposed major diversion of Great Lakes water to the United States*** * Apr 1984 * 31p

A large volume diversion of water from the Great Lakes Basin is not the solution to the water shortage problem faced by farmers in the American south-central and south-west states. The impacts on the basin would be inestimable in terms of environmental, social and economic costs. This submission addresses water diversion; some of the implications of decreased water levels attributable to diversions including power generation, Great Lakes shipping, shoreline property, industry and manufacturing, natural environment, and communities and municipalities; and some of the contributions that can be made through an environmental planning or ecosystem approach to solve the problem. This latter is a form of planning that seeks the best fit between human activities and surrounding environments and acknowledges a duty to present and future generations to promote a healthy environment capable of self-sustained continuity and stable adaptation. Other ways to solve the water shortage problem include practising water conservation and growing crops that are not as water-demanding. The need for public education and participation in Great Lakes Basin management is also outlined.

335 (074648)
SANKEY, W. * ***Submission of Mr. Wayne Sankey*** * 15 June 1984 * 2p

This personal submission argues that water export from British Columbia under specified conditions could be profitable without causing any adverse effects to the environment. A water tanker built in Canada could provide employment in the marine industry and could be sold as an oil tanker after the water export scheme was deemed unworkable or unprofitable. Pure drinking water can be offered to the world for only the cost of transportation. It is felt that the issue of water export in Canadian water policy must be addressed with an open mind.

336 (074634)
SASKATCHEWAN RESEARCH COUNCIL * ***So it can't happen here, eh? : plan for tomorrow ... today!*** * 1984? * 7p

Suggestions are made on how to deal with the economic, industrial and population growth in Saskatchewan. Operational research is needed on a systems approach to water resource management, modelling/forecasting methods, knowledge about climate change, streamflow changes from basin modification, urban hydrology management and water use psychology. Saskatchewan-specific issues discussed are water quality and quantity in the Mackenzie, Hudson Bay and Missouri drainage basins and water management including water diversion, water use and increased irrigation, water pricing, and heritage rivers designation. It is recommended that the federal government put large existing data banks to more and better use; allot more funds to water resources management; place more emphasis on water research; initiate communication with the people of Canada; and provide encouragement and incentives.

337 (074637)
SAVE THE ROUGE VALLEY SYSTEM * ***Submission of Save the Rouge Valley System*** * 01 Nov 1984 * 2p

From the viewpoint of a local watershed in eastern Metro Toronto, the relationship between a local community and the Great Lakes Basin is explored. It is suggested that the role of public participation be elaborated to illustrate how water quality affects everyone; regional lists of action groups be established to help citizens get information on cleanup efforts; ways be developed on how citizen groups can obtain intervenor funding for environmental fights' legal fees; more widespread announcement be made of materials available in education use; the public be educated on the inseparable relationship between soil and water; the user-pay and polluters-pay approach be explored; planners be more sensitive to the relationship between what they are doing and the social goal of clean fresh water; and watershed associations be encouraged to develop a sense of complete ecosystems.

338 (074619)
SEWELL, J. * ***Brief for the Federal Inquiry on Water Policy : a study of interrelationships and suggested water policies*** * 19 Dec 1984 * 21p

This submission focuses primarily on water policy as it relates to hydro and thermal electricity generating plants. Discussion touches on industrial activity to provide examples which stress the interrelationship between water use, energy consumption and the manufacturing sector. The following problems are identified and discussed in detail: water diversions cause critical problems to donor areas; overcapacity of energy megaprojects lead to massive water inefficiencies; effective water policy in manufacturing would influence pollution control and energy and water conservation; agriculture and forestry require on-site water availability to maintain productivity; insular planning and the inappropriate pricing of energy is detrimental; and water taxation must reflect direct and indirect use of water. A sensible water policy must discourage major water diversion schemes and take steps which would set a ceiling on direct or indirect allowable water withdrawals. Since further water diversions are undesirable, making water budgeting a necessity, an increasingly decentralized renewable energy system becomes most feasible, preferably with small incremental development. Implementing water policy by funding priorities, taxation practices, educational input and approving legislation are detailed.

339 (074271)
SHANNON, F. • ***Submission of Mr. Frank Shannon*** • 15 Dec 1984 • 8p

This brief represents a personal retrospection on water development of the Kootenay-Columbia River system in southeastern British Columbia. It states that Americans received the benefits of flood control without paying the true costs of the development. Environmental and ecological effects are detailed at Libby, Duncan, Mica and Revelstoke dams and at Kootenay and Arrow lakes. The almost total destruction of the anadromous fishery in the Okanagan/Similkameen rivers is cited as the worst case of federal neglect and irresponsibility. The agreement gave cheap power which meant an export of industry and jobs, but did not consider the loss of fish, wildlife and recreational values, and resulted in the inadequate clearing of reservoir areas. A stronger federal presence in disputes or agreements about interprovincial or provincial-territorial water use is recommended. Possible changes to the 1970 Canada Water Act are outlined in the submission's covering letter.

340 (074640)
SHELTON, S. • ***Submission of Mr. Sid Shelton*** • May 1984 • 4p

An excess of surface water and a shortage of potable water are highlighted as major problems in Hatzic Prairie, east of Mission, British Columbia. Much of the residents' water supply comes from wells, and the water is high in calcium, magnesium and iron. The problem of poor quality potable water can be addressed if the federal government places conditions on aid money to local areas to ensure that the funds are used to improve the health and safety of the residents; an ongoing aid program be instituted by Parliament to upgrade substandard water supply and establish a decent water supply in communities without one; and part of the money received by the British Columbia government from its water tax (mainly from the charges to BC Hydro for water used to generate electricity) be returned to residents as grants-in-aid for establishing adequate potable water systems where needed.

341 (074599)
SLOCAN VALLEY WATERSHED ALLIANCE • ***Documents for watershed management*** • 15 Oct 1984 • vp

This handbook outlines in general and specific terms a practical land use planning process whose objective is to plan coordinated, integrated resource management in watershed areas. It is considered useful in all forest-based ecosystems of British Columbia. This process is intended to protect water users and not to stop logging or mining. The Slocan Valley Watershed Alliance (SVWA) is committed to seeing that all interests are treated fairly and impartially, and that resource use is planned and implemented effectively with consideration for all users. Included in this handbook are sections on SVWA flow chart of process for watershed management planning and plan implementation; primary watershed management document stating principles for planning and carrying out forestry activities as well as land use requirements in Slocan Valley watersheds, and details of the Valley's watershed planning process; cost-effectiveness planning process for watershed management; implementation of watershed management; literature review on soil compaction and designated skid roads; and a scientific paper on forest harvesting and water management.

342 (074612)
SOUTH OKANAGAN ENVIRONMENTAL COALITION • ***Submission to the Inquiry on Federal Water Policy by the South Okanagan Environmental Coalition*** • 28 Nov 1984 • 3p

Continuing water quality degradation in the South Okanagan are a deep concern to the residents. The main sources are sewage outfall, industrial effluents, and runoff from timber-harvested areas and from farm lands where chemicals are routinely applied. The proposed use of 2,4-D to control the growth of Eurasian milfoil is opposed as are any other chemical means of control. Alternatives like mechanical harvesting, dredging and application of screens to the milfoil beds are advocated. The supply of good quality water to future generations is seriously jeopardized by forestry, mining and other development interests.

343 (074632)
STARK, J.K. • ***A brief - addressing the problem of drinking water*** • 1984 • 6p

This submission stresses that public consciousness and awareness of drinking water quality is very evident in Canada as the growing success of the presenter's Canadian Apollo Filter for drinking water attests. The general public is concerned that water cleaned with granular activated carbon ends up just as contaminated as before when it passes through old pipes and leaching occurs. The uncertainty surrounding drinking water quality is also getting much exposure in the media. It is hoped that the Inquiry can result in a stricter national drinking water standard and in drinking water regulations that are made into laws to be followed by all communities regardless of size.

344 (074615)
STORGAARD, L.; TREADGOLD, J. • ***Brief on water as it relates to fisheries in the Okanagan Valley*** • 07 Dec 1984 • 7p

The loss of excellent fishing in the main lakes of British Columbia's Okanagan system and its 14 creeks is mainly a result of a lack of adequate water for fish and their regeneration. Dams on the main lower and upper lakes destroyed spawning habitats due to water level fluctuations. Large numbers of shore-spawning kokanee were killed when eggs were left high and dry as the water levels were lowered. The 1967 Canada-British Columbia Okanagan Basin Agreement has not helped the situation because few implementations of its recommendations have gone forward. This submission details nine recommendations focusing on the need to

improve quantity and quality of streams feeding the Okanagan Lake system, limit water licenses, establish more reservoirs in individual water districts to hold spring runoff waters, minimize logging activity, and encourage use of pumps to obtain water from the lake rather than diverting it from streams feeding the lake.

345 (074270)
SUMMERLAND SPORTSMAN'S ASSOCIATION; BC WILDLIFE FEDERATION, THE OKANAGAN REGION • ***Submission by the Summerland Sportsman's Association*** • Dec 1984 • 7p

This submission describes the present system of water management in the Okanagan Valley and explains how continued pressure is being placed on the Valley's water quantity and quality by logging, mining and other industrial development as well as waste disposal of sewage water and septic tank effluents. The fruit and vegetable industry and the tourism/recreation industry, both important parts of British Columbia's economy, are in jeopardy. The effects on fish and wildlife are also outlined. It is recommended that the present regional district arrangement be replaced by a valley authority patterned after the Creston Valley Wildlife Management Area; this Authority be established and financed by the provincial and federal governments; present water acts be reviewed in light of information presented at hearings; water quality research and testing be part of the duties of Summerland Agriculture Research Station; and the anadromous fish population be more adequately protected by the federal government.

346 (074608)
SUNSHINE COAST REGIONAL DISTRICT • ***Brief of the Sunshine Coast Regional District*** • 20 Nov 1984 • 1p

The export of water from Freil Lake, British Columbia, will adversely affect the growing mariculture industry and its employment opportunities as well as the delicate ecosystem of Hotham Sound, particularly the Freil Falls at the lake's outlet. The unique combination of economic and environmental factors need to be considered in the export of any body of water. Local government bodies should be an integral part of the decision-making structure with respect to water bodies within its jurisdiction as it provides a forum for local input.

347 (074623)
SUZARA, F.L. • ***Submission of Fructuoso L. Suzara*** • 07 Feb 1985 • 6p

This submission takes exception to a premise expressed in the participation paper of the Inquiry on Federal Water Policy that no changes to the constitution will be suggested since much of the policy and management of water resources is the constitutional responsibility of the provinces. The Inquiry will therefore determine the scope of federal responsibilities in water matters and how they mesh with other jurisdiction. Four courses of action are suggested for water resources management in Canada: status quo; ad hoc or minimal intervention; federal legislation to solve problems through an interdisciplinary federal/provincial/local government participation; and constitutional amendment to include river basins, lakes, rivers and waterworks as the federal government's repository of unallocated powers. It is felt that although the third option seems to be the one most favoured by the decision-makers, it is really the fourth option which provides a lasting solution and a comprehensive and integrated approach.

348 (074642)
TECHNICAL UNIVERSITY OF NOVA SCOTIA, CENTRE FOR WATER RESOURCES STUDIES • ***Presentation to Inquiry on Federal Water Policy by the Centre for Water Resources Studies*** • Jan 1985 • 7p

Concerns apparent to the Centre for Water Resources Studies related to the supply of water for human consumption are detailed under the following headings: the value of water as a resource; water-related research; standards and guidelines; operator training; public information; watershed management; and funding. It is concluded that federal policy should assign a higher priority to water; spending on water quality protection should be increased; the full costs of producing a high quality water supply are not recognized; regional water problems should be recognized in support programs for water research; the possibility of national water quality standards should be approached cautiously; more attention should be devoted to increased public awareness; programs for operator certification and training should be developed; and watershed management should be recognized as a principal tool in drinking water quality management in the Atlantic Region. A supplementary paper on watershed management in Nova Scotia is attached.

349 (074606)
TUNGAVIK FEDERATION OF NUNAVUT • ***Tungavik Federation of Nunavut submission*** • Nov 1984 • 10p

Effective water resources management requires a single policy rather than individual department policies. In the case of Nunavut in the Northwest Territories, this policy can only be appropriately developed in the north by northerners and must include greater control by a Nunavut government. The policy must reflect the social, cultural, economic and environmental needs of the residents and Nunavut government, provide for the conservation and sensible use of water resources through an integrated system of management with other resources, provide compensation for residents detrimentally affected, and recognize the need to integrate offshore and onshore management needs. Increasing demands on northern water resources for mineral resources development and hydroelectric power generation are detailed. An agreement-in-principle negotiated with the federal government by the Tungavik Federation of Nunavut provides for a wildlife management board, land use planning, ecosystemic

impact statements by proponents for use of resources, and public hearings for residents to state their concerns. Negotiations for certain rights in water on Inuit land are continuing.

350 (074610)
WATSON, A.S. * ***An emerging water issue : the interaction between Canada's water-sector and Canada's industry-sector, in respect of the potential economic benefit derivable from 'water-product' manufacture in Canada*** * Nov 1984 * 17p

This submission addresses certain policy issues which derive from the interaction between Canada's water-resource government authorities and Canada's water-resource-related industrial/manufacturing sector. Evidence and indicators are presented to show that this interaction is less than satisfactory in terms of a healthy industry subsector, established companies, and recognized product lines. Canada's government sector/industry sector interaction is contrasted in a natural resource sector of the economy and the result is highly satisfactory, the industry sector renowned, and its companies and products internationally recognized. The civil engineering/concrete structures subsector of the Canadian water-industry sector is strong while the water-products manufacturing subsector has been extremely weak. It is recommended that the Inquiry should examine this and perhaps institute a new policy which would require all Canadian water-sector specifications, guidelines, standards, or codes-of-practice to identify or recommend a Canadian-manufactured source for water-quantity or water-quality hardware needed for the procedure in question. National policy signals are needed and appropriate.

351 (074613)
ZALTSBERG, E. * ***Hydrogeological mapping : regional distribution of groundwater resources*** * July 1984 * 10p

A proposed program to obtain a reliable and generalized basis for any present and future engineering or social development activities involving groundwater use is described. Activities would include groundwater management and planning; domestic, industrial and municipal water supply; land reclamation; underground conservation of energy; environmental assessment; and groundwater protection. The proposed program would be mainly based on available data such as geologic and climatological maps, streamflow records, and water supply well records. The hydrogeology map of the territory under study will be a set of maps consisting of bedrock hydrogeology, quaternary hydrogeology, groundwater regime, groundwater resources, hydrochemistry of bedrock aquifers, and hydrochemistry of quaternary aquifers. Each map will be accompanied by an explanatory text and the scale will depend on available geohydrological and geological data as well as the area under investigation. These maps will be beneficial for long-term regional groundwater planning and management.

SECTION 3

RIVER BASINS / BASSINS VERSANTS

PACIFIC OCEAN / OCÉAN PACIFIQUE

5. FRASER RIVER BASIN / BASSIN VERSANT DU FLEUVE FRASER

Miscellaneous reports / Rapports divers

352 (069378)
HARVEY, C. * ***Results of public involvement*** * Mar 1982 * 76p

This report describes and presents the results of the Public Involvement Program carried out under Phase II of the Fraser River Estuary Study. The study was designed to develop a management program to guide future changes in the estuary in order to preserve and protect it as a natural resource while continuing to serve as a vital economic source. Personal interviews were conducted with leaders of public groups and user interests to identify a range of issues and concerns. Public workshops and meetings, which were the core of the public involvement program, gathered information on concerns related to recreation, fish and wildlife habitat, water quality, land use and transportation, management, the forest industry, marine transportation, fisheries, unions, natives, and agricultural interests. Results of a questionnaire are included which focused on determining public opinion on the policies drafted by the study. Guidelines for ongoing public involvement in estuary management are also presented.

353 (069379)
Information guide * Fraser River Flood Control Program, Victoria, BC * Dec 1968 * 25p

In May 1968, Canada and the province of British Columbia signed an agreement covering a plan for flood control in the Fraser Valley of British Columbia. This report includes a copy of the agreement with an explanation of how it will be implemented and a list of people involved in administering the agreement. Procedures to be followed by a local area or municipality in applying for assistance are outlined and details of the cost-sharing formula are specified.

354 (069377)
A living river by the door : a proposed management program for the Fraser River estuary * Mar 1982 * 64p

Issues and concerns identified by groups, organizations and agencies representing all types of interests in the Fraser River estuary, along with technical data, have been used to prepare the proposals contained in this report of Phase II of the Fraser River Estuary Study. The proposals include a vision, policies, area plans, activity programs and a management system. The vision described creates a picture of what the estuary would be like in ten to 20 years from now. It is a compendium of images described by participants at an estuary-wide public workshop and by leaders of agencies and user groups in the estuary. Policy guidelines, goals and objectives are described which have considered this vision and translated it into actions that need to be implemented by public agencies in order to ensure that the vision is achieved. The goals and objectives deal specifically with land use and transportation, water quality, habitat management, and recreation. The evolution of a linked management system is described which provides a framework for interagency cooperation and consists of organizational structures, processes and procedures for management and for conflict resolution. The content of activity programs and area plans that will be implemented are outlined to illustrate their role and function in the management program. Included with the report is a second draft area designation map which reflects management plans and programs.

355 (032060)
ENVIRONMENT CANADA, FISHERIES AND MARINE SERVICE * ***An assessment of the effects of the system e flood control proposal on the salmon resource of the Fraser River System*** * Jan 1974 * 563p

This document was prepared under arrangement with the Canada-British Columbia Fraser River Joint Advisory Board's Fraser River Upstream Storage Review dated December 1976. It was prepared for the Ecology Subcommittee of the Fraser River Upstream Storage Steering Committee. This document presents results of a survey conducted on basins affected by the proposed system e development to determine their potential capacity for anadromous stocks, to substantiate the present escapement records, and to establish the

present water quality and water temperatures of the upstream and downstream areas. The eight dam sites are illustrated and descriptions made of each proposed development. The interpretation of the survey data contained in the report provides a reasonably accurate account of the potential of the affected areas. A detailed description is given of the analytical techniques utilized in obtaining data regarding water quality and temperature regimes.

356 (032061)
An assessment of the effects of the system e flood control proposal on the salmon resource of the Fraser River System, appendices * (1974) * 350p

This document was prepared under arrangement with the Canada-British Columbia Fraser River Joint Advisory Board's Fraser River Upstream Storage Review dated December 1976. This document contains field survey data obtained from the system e study. Appendix A contains the results of the field surveys under five headings (Grand Canyon Basin, McGregor River Basin, Cariboo River Basin, Clearwater River Basin, and a description of the affected basin, the major river and tributary streams and the results of the water quality survey). Appendix B contains a review of the concepts of recreational evaluation and the rational for choosing the direct questioning technique; an outline of the interview techniques employed; the mean recreational values obtained from survey data; and a list of references on recreational evaluation.

6. OKANAGAN-SKAGIT RIVER BASINS / BASSINS VERSANTS DES RIVIÈRES OKANAGAN ET SKAGIT

Final report / Rapport définitif

357 (069375)
The main report of the Consultative Board * Office of the Study Directorate, Penticton, BC * Mar 1974 * xi, 535p

This report presents a comprehensive framework plan for the development and management of water resources in the Okanagan Basin. In developing the plan, social and economic studies were conducted to examine existing relationships between water resources, economic growth and aesthetic values. For each of three different forecasts of economic activity in the Okanagan, projections of water requirements, waste loadings from industry and municipalities and recreational demands for fishing and shoreline activities were estimated. As well, socioeconomic studies were conducted to evaluate water resource development and management alternatives and detailed hydrologic studies were undertaken to assess the water supply potential of both surface and groundwater resources, to evaluate means of regulating flow through storage and diversion to meet consumptive and non-consumptive water requirements and to analyze ways for augmenting existing water supplies within the basin itself. The quality of lakes and streams was assessed and an inventory of all direct and indirect sources of wastes discharged into these waters was prepared. Analytical studies were undertaken to determine the capacity of surface waters to assimilate present and future waste materials without adversely affecting potential uses of these waters for drinking or recreational purposes. Pilot projects for advanced treatment of waste water were established in Vernon, Kelowna and Penticton. The adequacy of existing institutional and legal frameworks to manage water and related resources was studied and recommendations made on changes required to ensure more efficient water and waste management. Public participation was an essential ingredient in developing the framework plan and several new techniques were devised and applied to obtain a broad representation of public opinion.

Summary report / Sommaire

358 (069376)
Summary report of the Consultative Board including the comprehensive framework plan * Canada-British Columbia Consultative Board * 31 Mar 1974 * v, 41p

This report presents the basic recommendations of the Consultative Board dealing with broad management programs, institutions and processes affecting water resource development throughout the Okanagan Valley. A detailed set of recommendations, in some cases with associated costs and benefits, is presented under the heading of water quantity, water quality, fisheries, and water-based recreation. These recommendations reflect actions necessary to improve or protect the environment while maintaining the economic viability of the valley.

Appendices and supplements / Appendices et suppléments

359 (032093)
CANADA-BRITISH COLUMBIA OKANAGAN BASIN AGREEMENT * ***Technical supplement I to the final report, water quantity in the Okanagan Basin*** * Mar 1974 * 610p

This report describes and presents the results of water quantity studies as carried out under the Okanagan Basin Agreement, including the synthesis of all historical water quantity resource data into a summarized form. Information is provided on climate, hydrology, the main stem system, present day water requirements,

droughts and floods, water supply in eight selected tributaries, forest hydrology, ground water, water quantity monitoring and technical advances. The report evaluates the existing hydrologic regime of the basin and evaluates means of regulating flows through storage and diversion and means augmenting the surface water supply within the Okanagan Basin.

360 **(032094)**
CANADA-BRITISH COLUMBIA OKANAGAN BASIN AGREEMENT * ***Technical supplement II to the final report, water quantity computer modelling*** * Mar 1974 * 210p

This report describes the mathematical models developed in the course of the water quantity part of the Okanagan Basin study. It also provides results from the model studies which are presented in summary form and in detailed form to facilitate close comparison of the many alternatives investigated. The tributary operating model provides useful first estimate data for planning purposes, while the mainstream model provides useful data for assessing the performance of possible management alternatives.

361 **(032095)**
CANADA-BRITISH COLUMBIA OKANAGAN BASIN AGREEMENT * ***Technical supplement III to the final report, water quantity alternatives & supporting water quantity data*** * Mar 1974 * 551p

This report presents and evaluates alternatives for the management of water quantity in the Okanagan Basin to the year 2020. It also deals with tributary and mainstream water management alternatives, and provides supporting basic data and interpretive information on water quantity.

362 **(032096)**
CANADA-BRITISH COLUMBIA OKANAGAN BASIN AGREEMENT * ***Technical supplement IV to the final report, water quality and waste loadings in the Okanagan Basin*** * Mar 1974 * 565p

This report describes and presents the results of all water quality studies as carried out under the Okanagan Basin Agreement. It contains information on stream quality, storm sewer discharge, dustfall and precipitation, nutrient loading, bacteriological studies, pesticide use, septic tank effluent influence on receiving water nutrient gain from groundwater as well as water quality evaluation results and recommended programs for quality control.

363 **(032097)**
CANADA-BRITISH COLUMBIA OKANAGAN BASIN AGREEMENT * ***Technical supplement V to the final report, the limnology of the major Okanagan Basin lakes*** * Apr 1974 * 261p

This report describes and presents the results of limnological research on the main valley lakes as carried out under the Canada-British Columbia Okanagan Basin Agreement. The study provides a broad characterization of the main valley lakes with a view to determining the cause of apparent water quality deteriorations. Based on the knowledge gained from this study, standards were established with respect to the annual phosphorus load that each of the main valley lakes can assimilate.

364 **(032098)**
CANADA-BRITISH COLUMBIA OKANAGAN BASIN AGREEMENT * ***Technical supplement VI to the final report, review and evaluation of wastewater treatment in the Okanagan Basin*** * Mar 1974 * 267p

This report presents the results of studies on water reuse and pilot projects for the advanced treatment of waste water. It also includes an examination of existing treatment facilities in the Okanagan Basin and their capability for the removal of nutrients. The first four chapters review the results of studies on the suitability of present waste treatment plants. Management alternatives for the mentioned wastewater systems are presented.

365 **(032099)**
CANADA-BRITISH COLUMBIA OKANAGAN BASIN AGREEMENT * ***Technical supplement VII to the final report, value and demand for water in the Okanagan Basin*** * Mar 1974 * 200p

This two-part report discusses the value of water in the Okanagan Basin based on an econometric model of the region, and provides estimates of present and future water requirements within the basin. Part I presents estimates of the value of water resources used for irrigation and industry in the Okanagan Basin. As well as presenting derived values, the report contains a generalized review of the economic theory underlying water valuations and the objectives of estimating these values. Part 2 covers the water quantity requirements in the basin. Consumptive uses of water such as irrigation, domestic and industrial uses are examined to determine the present consumptive use requirements and to predict the pattern and volume of use up to the year 2020.

366 **(032100)**
CANADA-BRITISH COLUMBIA OKANAGAN BASIN AGREEMENT * ***Technical supplement VIII to the final report, water-based recreation in the Okanagan Basin*** * Apr 1974 * 211p

This report describes and presents the results of water-based recreation studies carried out under the Okanagan Basin Agreement as part of the socioeconomic program. Its main purpose is to provide information on the current and future economic and social values associated with the recreational use of beaches in the Okanagan Basin. The survey on resident participation in outdoor recreation is included and was a part of a larger survey on residents' attitudes to water resources and recreation in the Okanagan Valley.

367 **(032101)**
CANADA-BRITISH COLUMBIA OKANAGAN BASIN AGREEMENT * ***Technical supplement IX to***

the final report, fisheries and wildlife in the Okanagan Basin * Mar 1974 * 249p

This report describes and presents the results of fishery resource studies and water-dependent wildlife studies as carried out under the Canada-British Columbia Okanagan Basin Agreement. The report identifies the current fishery resources within the basin, estimates present and potential harvest capacities of the various resource components with reference to water quantity and quality as well as current sport and commercial fishery use. The socioeconomic aspects of the fishery are identified and projections and alternatives given for water and fisheries management conducive to meeting anticipated angling and water demands in the basin over the next 50 years.

368 **(032102)**

CANADA-BRITISH COLUMBIA OKANAGAN BASIN AGREEMENT * ***Technical supplement X to the final report, economic growth projections in the Okanagan Basin*** * Apr 1974 * 169p

This report describes and presents the results of economic growth studies carried out under the Okanagan Basin Agreement as part of the socioeconomic program. The aim of the economic growth study was to provide a basis for water resource planning from 1970 to 2020. The advantages and disadvantages of the input-output model approach which was used partly as an experimental method in river basin planning are included.

369 **(032103)**

CANADA-BRITISH COLUMBIA OKANAGAN BASIN AGREEMENT * ***Technical supplement XI to the final report, public involvement in the planning process*** * Mar 1974 * 485p

This report describes and presents the results of the public involvement program carried out under the Okanagan Basin Agreement. The input from this program concerning the preferences of Okanagan Valley residents for the future management of the basin's water resource was an essential ingredient in the development of the comprehensive framework plan. The report presents details as to the program's makeup, its process, the results and conclusions reached. The public involvement program as developed in the midst of the Okanagan study had a model and did achieve its objectives.

370 **(032104)**

CANADA-BRITISH COLUMBIA OKANAGAN BASIN AGREEMENT * ***Technical supplement XII to the final report, planning and administration*** * May 1975 * 255p

This report describes the planning concepts and arrangements used in the study of the water resources of the Okanagan Basin and the evolvement of a plan for the development and management of this resource. It also outlines the administrative arrangements for carrying out the study and presents a breakdown of costs for various study components.

7. YUKON RIVER BASIN / BASSIN VERSANT DU FLEUVE YUKON

Final report / Rapport définitif

371 **(F12433)**

Rapport d'étude sur le bassin hydrographique du fleuve Yukon * Comité du bassin hydrographique du fleuve Yukon * sept 1984 * xvi, 125p

Le gouvernement du Canada, celui de la Colombie-Britannique et celui du Yukon ont conclu, le 24 novembre 1980, une entente relative à l'étude et à la planification des ressources en eau dans le bassin hydrographique du fleuve Yukon. Dans le cadre de cette entente, le Comité du bassin hydrographique du fleuve Yukon fut créé. Ce rapport, résultat des travaux du Comité, a pour but d'examiner le concept de l'aménagement dans une perspective de conservation ou d'utilisation avisée de l'eau. Une description des ressources en eau et des ressources annexes du bassin est présentée, suivie d'une discussion sur leurs utilisations actuelles et possibles. De l'avis du Comité, même si les utilisations actuelles de l'eau du bassin n'ont pas encore suscité de conflits graves sur le plan de la gestion du bassin, plusieurs projets d'aménagement pourraient se concurrencer au niveau de l'utilisation de l'eau. La répartition optimale de cette ressource entre tous les usagers constitue le défi que devront relever les organismes chargés d'assurer la gestion de l'eau et les ressources connexes dans le bassin. Dans plusieurs cas, les gestionnaires devront choisir entre des utilisations concurrentielles ou négocier des compromis avec plusieurs usagers possibles. Le principe de la conservation de l'eau est présenté d'une façon détaillée, et les possibilités qu'il offre pour contribuer à résoudre certaines préoccupations clés reliées à l'utilisation concurrentielle de l'eau sont étudiées.

372 **(070127)**

Report on the Yukon River Basin Study, September 1984 * Yukon River Basin Committee * Sept 1984 * xvi, 111p

This report describes the background, objectives, study area and organization of the Yukon River Basin Study. An overview is provided of the basin's physiography, climate and vegetation, and the water resources, fish populations and wildlife of the basin are described. The strengths, limitations and unique aspects of these resources are identified. Opportunities for water use in the basin are outlined and a brief description is given of its history and demography. Opportunities for the development of water and related resources in the basin are considered, and challenges to water resources management posed by potential conflicts in water uses

are discussed. Recommendations for future steps required to achieve the wise use of the basin's water resources are presented. An annotated bibliography of all project reports of the Yukon River Basin Study is provided in the appendices.

Appendices and supplements / Appendices et suppléments

373 (071428)
Energy Work Group program report * 30 Nov 1984 * iv, 78p

This report summarizes the concerns of the Energy Work Group and sets out a series of recommendations intended to stand as guidelines to managers involved with energy planning and water management. The specific objectives and work program followed by the Energy Work Group are described and briefly commented upon. Energy use projections in the Yukon are summarized and hydroelectric resource potential is considered as well as the importance and characteristics of storage options. Implications for interconnecting the Yukon electrical system with an external source are considered and a comparative analysis is made of existing and potential energy alternatives. Coordinated energy planning and conflict resolution are briefly addressed.

374 (070237)
ENNIS, G.L.; JOHNSTON, R.A.C.; WHATELY, M.; REYNOLDS, D.; PENDRAY, T.; DAVIES, D. * ***Fisheries Work Group program report*** * June 1984 * vp

As part of the Yukon River Basin Study, the Fisheries Work Group assessed existing knowledge of the fisheries resources in the basin in terms of stocks, utilization and management; collected additional information to increase the understanding of the fisheries resources; assessed opportunities for growth in the basin, and identified potential resource use conflicts. This group also put forward a variety of management scenarios for the basin's fisheries. A brief description of the major objectives, approach, and results of the group's nine projects carried out to fill some of these gaps is provided. These include an annotated bibliography and information summary on the basin's fisheries resources; effects on Arctic grayling of short-term and prolonged exposure to placer mining sediments; stream habitat inventory and evaluation for two study areas; lake productivity; distribution and abundance of chinook and chum salmon; creel census results of three lakes; creel census of Atlin Lake; and life history and habitat utilization of Arctic grayling. Recommendations are provided under two headings: management guidelines, and research and inventory requirements.

375 (071427)
PLACER MINING WORK GROUP * ***Yukon River Basin Study, Placer Mining Work Group, program report*** * Sept 1984 * 30p

This report summarizes the information available on placer mining in the Yukon River Basin and presents the conclusions of the Placer Mining Work Group. The history and value of the industry in the area is given, the geological settings described, and the present and potential placer mining areas discussed. The institutional setting for placer mining is presented along with the work group recommendations for institutional change. Effluent treatment technology in placer mining and the role water plays in gold recovery is highlighted. Finally, there are discussions of fisheries and other resource issues affected by placer mining.

376 (070077)
LYONS, R.O. (CHAIRMAN) * ***Hydrology program report*** * Inland Waters Directorate, Pacific and Yukon Region, Vancouver, BC * Sept 1984 * v, 94p

The Hydrology Program Report summarizes the hydrology component of the Yukon River Basin Study carried out jointly by Canada, Yukon and British Columbia under the direction of the Yukon Basin Committee. Four projects are summarized, covering hydrologic data network assessment, ice regime studies, investigations of flooding in the basin and the development and use of a Yukon River routing model. The hydrology of the Yukon River Basin is discussed and conclusions regarding the need for future hydrologic investigations are presented.(au)

377 (070235)
D'AQUINO, S.A.; HEARTWELL, C.; BRICKMAN, B. * ***Socio-economic program report*** * Government of Canada; Province of British Columbia; Government of the Yukon Territory * June 1984 * 98p

As part of the Yukon River Basin Study, a socioeconomic program was completed to evaluate the potential for growth in the basin to the year 2003 and to assess the social and economic implications of this potential growth. This report develops a complete socioeconomic data base to identify the demographic and economic characteristics of the basin. To utilize the data, an economic simulation model of the Yukon's economy was constructed to allow for an examination of the basin's economy under various conditions of growth. The five chapters provide a brief statement on the purpose and objective of the program; a brief description of the current demographic characteristics of the basin and the status of the current economic situation; a summary review of the various projects highlighting results, contribution to the basin study program, and long-term potential for use in socioeconomic analysis; a future look at the basin's economy; and concluding comments with respect to the economy and future socioeconomic studies.

378 (070231)
Water related recreational resources, (outdoor and heritage) : Tourism, Parks and Recreation Work Group : program report * Aug 1984 * 78p

This report follows two general themes: the first emphasis is on basic water-oriented recreational resources, including outdoor and heritage, and on the ability of the Yukon River Basin to attract and sustain recreational use, with the implications this has on water management. A second theme considers the interrelationship between the land and the water, and between the management of both as essential to the protection and development of recreational pursuits. In this regard, recreation is seen as straddling the interface between land and water issues and management. The interrelationships of the numerous factors that influence recreation potential and use, including the land/water continuum and the question of "values" in management decision-making are examined. An overview of the basin is presented in order to establish the biophysical environment for outdoor and heritage recreational resources, and there is a consideration of such factors as settlement patterns, access and competing land and water users. Recreational setting, use and potential is then discussed by sub-basin. Recommendations deal with recreation, tourism planning and management coordination; recreation inventories; use, planning and management directions; sport fishing; access to outdoor recreation and heritage resources; values and lifestyles; and sub-basin priorities. Appendices present a summary of work group projects, background Yukon River Basin maps, statistics on tourism in the Yukon, and a description of terms related to use designations.

379 (070236)
Yukon River Basin Study : Water Quality Work Group program report * Apr 1984 * 23p

As part of the Yukon River Basin Study, a Water Quality Work Group reviewed the existing information on water quality in the basin, identified present information gaps, and outlined potential studies which would provide the necessary information to fill the existing gaps. Through a review of available information, two important information gaps were identified and studied: a basin-wide water quality data base and an understanding of the processes controlling the depression of dissolved oxygen under winter ice cover. Additional projects identified but not undertaken because of time and funding limitations are briefly discussed: asbestos distributions in the basin and the processes which control these distributions; processes controlling sediment releases in the White River drainage and subsequent effects of the sediment on water chemistry; relationship between aquatic biota and the metals in their environment; groundwater resource and the options for management of ground-water. The work group recommended the future maintenance and expansion of the water quality data base to improve decisions by water quality managers.

380 (070509)
Yukon River Basin Study Wildlife Working Group : program report * 06 June 1984 * 74p

As part of the Yukon River Basin Study, inventories of wildlife species and studies of habitat use with emphasis on the floodplains of major rivers within the basin were undertaken. This report identifies five wildlife areas in the basin: furbearer inventory, habitat assessment and trapper utilization; moose population dynamics and habitat use; factors affecting the fall staging of waterfowl at Nisutlin Delta; spring staging of waterbirds at early open water sites; and inventory of Canada geese and other waterfowl. A species-specific description of important ecological relationships, knowledge gaps, and potential conflicts with water development projects must be taken into account in the design of a comprehensive water policy for the area. A description of the physical and biological processes of riparian ecosystems affecting wildlife is provided. The study concludes that the basin needs a comprehensive resource management plan which would recognize wildlife values as important to multiple land-use activities.

381 (070128)
SNARY, R. * ***Yukon River Basin Study : information exchange and public participation program report*** * July 1984 * 33p

This report summarizes the activities of the Information Exchange and Public Participation Program of the Yukon River Basin Study in addressing the objectives of both the internal and external components of the program. The utilization of available media resources is described, and the development and dissemination of information through reports and other publications is explained. Tactics used in informing all involved or interested government agencies are described as well as aspects of the public participation program. The structure and operation of the Independent Review Group as a vehicle for public input to the study is explained.

Miscellaneous reports / Rapports divers

382 (068434)
WRIGHT, A.; HODGE, R.A. * ***Yukon energy bibliography*** * Nov 1983 * 31p * (Yukon River Basin Study, Energy Work Group Report No 1, Archival Task)

This bibliography lists in alphabetical order documents relating to energy studies in the Yukon Territory. The majority of the entries are specifically related to hydroelectric energy and energy planning, while others deal with geothermal energy, wind energy, waste heat, coal and petroleum. For most citations, retrieval locations are also given.

383 (068805)
BC HYDRO, SYSTEM ENGINEERING DIVISION * ***Electric transmission interconnection study*** * May 1983 * vp * (Yukon River Basin Study Project Report: Energy No 2)

This study investigates the engineering and economic feasibility of alternative electric interconnections between Yukon regional load centres and generation sources outside the Yukon. Five alternative interconnections between the Yukon and sources outside the Yukon were evaluated: Stikine-Whitehorse, Stikine-Faro, Liard-Faro (all British Columbia alternatives), Bennett Field-Ross River (Northwest Territories alternative) and Susitna River-Whitehorse (Alaska alternative). Some conclusions reached are: a transmission voltage of 500 kV is feasible for each of the interconnection alternatives; the Stikine and Liard projects are the only feasible generating sites in BC for possible interconnection with the Yukon; the Stikine-Whitehorse alternative would require the least transmission line construction and the least direct capital cost and total annual charges for each of the three Yukon load levels studied; ranking of the three BC alternatives in terms of average delivery cost per kwh indicates that the Stikine-Whitehorse would have the lowest cost; and Alaska and Northwest Territories alternatives would impose larger economic penalties than the BC alternatives.

384 (068432)
MONENCO CONSULTANTS PACIFIC LTD. * ***The inventory of Yukon hydroelectric sites, a review of investigations carried out between 1960 and 1983*** * Monenco Consultants Pacific Ltd., Vancouver, BC * Oct 1983 * vp * (Yukon River Basin Study Project Report: Energy No 3)

This report was prepared as a background paper for the Energy Work Group. A review has been made of the available reports on hydroelectric investigations and studies in the Yukon Territory and in the BC portion of the Yukon River Basin carried out over the last 25 years. These have been summarized and evaluated relative to standards proposed as adequate for an up-to-date and reliable inventory of potential projects. Where possible, the findings of earlier studies have been compared with recent and more complete studies for confirmation or difference. The review has included assessment of project importance and the requirement for upgrading and updating studies and their input data. A tabulation of sites has been included indicating approximate ratings for importance and study adequacy.

385 (067523)
HODGE, R.A. * ***Review of Yukon energy demand studies*** * 31 Mar 1983 * vp * (Yukon River Basin Study Report: Energy No 4)

A study was conducted to review and assess all existing Yukon energy demand studies and the following topics were identified for inclusion in this review: the accuracy and completeness of base data; methodologies and assumptions; weaknesses and strengths; potential impact of conservation; unique problems in forecasting Yukon energy requirements; gaps in coverage with respect to the Yukon River Basin; and recommendations on the need for further analytical work on forecasting energy requirements. This report highlights the major points of comparison with a complete outline of each demand study being presented in an appendix to the report. The report discusses problems related to the existing available baseline energy data and reviews some of the major methodological approaches and assumptions. Gaps in coverage with respect to the Yukon River Basin are briefly outlined as are difficulties in projecting Yukon energy requirements. Comments are offered on the role of Yukon energy use projections and recommendations for additional work are given.

386 (068403)
MONENCO CONSULTANTS PACIFIC LTD. * ***Storage and the Yukon hydroelectric potential, a long range planning issue*** * Monenco Consultants Pacific Ltd., Vancouver, BC * 09 Mar 1984 * 52p * (Yukon River Basin Study Project Report: Energy No 5)

This study demonstrates the value of adequate flow control for economic hydro development. Storage projects can often be developed for multiple use of the water resource, and most have some non-power benefits for other water users. Storage is seen as particularly important in the North, with a high winter demand for power coinciding with the low natural stream flow. On rivers without headwater storage, economic hydro development will not normally be practical. In a comparison of artificial reservoirs produced by impounding in river valleys or the use of augmented lake storage, the latter is seen generally as a better alternative, both with regard to cost and environmental impact. Reservoir clearing costs can be as much as 25% of total project cost and are significantly affected by the clearing standards to be set by regulatory authorities. Guidance from such authorities is necessary to allow proper site selection between projects having large reservoirs requiring clearing, and those needing only minor clearing.

387 (068441)
MARVIN SHAFFER & ASSOCIATES LTD.; PATH ECONOMICS LTD.; H.J. RUITENBEEK RESOURCE CONSULTING LTD.; NEVIN SADLIER-BROWN GOODBRAND LTD. * ***Yukon energy inventory and utilization review*** * Marvin Shaffer Assoc Ltd. * Oct 1983 * 220p * (Yukon River Basin Study Project Report: Energy No 6)

This report reviews and analyzes all existing information on the potential availability, suitability and costs of alternative energy sources for the Yukon. The inventory of energy sources in the Yukon is described, and an attempt is made to identify the total magnitude and location of potential energy resources and to classify this potential in terms of such characteristics as the degree of certainty, accessibility and status of development. The report identifies and assesses the relative

costs, limitations, and advantages of the full range of energy sources which can be used presently or in the future to meet the Yukon's energy requirements.

388 (058887)
ENNIS, G.L.; CINADER, A.; MCINDOE, S.; MUNSEN, T. * ***An annotated bibliography and information summary on the fisheries resources of the Yukon River Basin in Canada*** * Department of Fisheries and Oceans, Vancouver, BC * June 1982 * 285p * (Canadian Manuscript Report of Fisheries and Aquatic Sciences No 1657)

This annotated bibliography provides a listing of 223 fisheries reports pertaining to the Canadian portion of the Yukon River and its tributaries (exclusive of the Porcupine River). Sources for the bibliography include periodicals, government and industrial technical reports and government records. Identification of source materials was facilitated by a computer search of several data bases. The bibliographic information is listed alphabetically by author and cross-referenced under the following sub-basin headings: Yukon River main stem, White River, Stewart River, Pelly River and Teslin River. The Aishihik River Basin was also referenced as there are existing proposals to divert water bodies of the Yukon system into the Aishihik system. Information collected for each sub-basin has been summarized and evaluated according to its applicability to the Yukon River Basin Study objectives. Data gaps are identified and some additional studies suggested for each sub-basin. References which were not received in time to be annotated are listed alphabetically. Alternative sources of fisheries information for the Yukon Basin such as other bibliographies and mapping projects are listed in a separate section.

389 (066403)
MCLEAY, D.J.; KNOX, A.J.; MALICK, J.G.; BIRTWELL, I.K.; HARTMAN, G.; ENNIS, G.L. * ***Effects on Arctic grayling (Thymallus arcticus) of short-term exposure to Yukon placer mining sediments: laboratory and field studies*** * Department of Fisheries and Oceans, West Vancouver Laboratory, West Vancouver, BC * May 1983 * 151p * (Yukon River Basin Study, Fisheries Project Report No 2)

A program of controlled laboratory and in-situ field bioassays was conducted during 1982-83 to examine the acute effects of suspensions of Yukon placer mining sediment on underyearling Arctic grayling (Thymallus arcticus). Wild grayling, captured as swimup fry or young fingerlings, were acclimated to warm water (15°C) or cold water (5°C) conditions for 7-12 weeks, and subjected to a range of concentrations of organic sediment (overburden) and/or inorganic sediment (paydirt) suspensions in recirculating test tanks. On two occasions (August and September 1982), grayling fingerlings were captured from central Yukon clear water streams and held for 4 or 5 days in cages within turbid creek water (Highet Creek) downstream of placer mining activities and at a nearby clearwater site (Minto Creek upstream of its junction with Highet Creek). It was concluded that the short-term exposure of Arctic grayling to sublethal concentrations of suspended inorganic or organic sediment can cause a number of effects including acute stress responses.

390 (067514)
PENDRAY, T. * ***Stream habitat inventory and evaluation for two study areas within the Yukon River Basin*** * Yukon Department of Renewable Resources, Whitehorse, YT * Nov 1983 * 55p * (Yukon River Basin Study Report: Fisheries No 3)

A biophysical stream inventory and fish habitat evaluation was carried out during the summer of 1982 on 65 streams in the Stewart River drainage near Mayo, Yukon, and 33 streams east of Atlin, British Columbia. The purpose of the study was to test and develop a methodology for stream habitat inventory and evaluation to be used to classify the fisheries importance of stream reaches in the Yukon River Basin. The inventory methodology employed during the survey was a slightly modified form of that developed by the Water Management Branch, BC Ministry of Environment. The report summarizes the results of the survey in terms of fish distribution and habitat utilization. Arctic grayling (Thymallus arcticus) and chinook salmon (Oncorhynchus tshawytscha) were the main species of sport and commercial importance captured during the survey. Data are presented for observed grayling habitat preference in terms of habitat type, depth, velocity, and cover. Stream reach descriptions and habitat evaluations are included for each reach surveyed. A proposed stream classification system is discussed and recommendations are made regarding appropriate stream inventory and evaluation methodology. It is concluded that the inventory methodology used for the survey provides an adequate level of data on which to base a habitat evaluation and would be the most practical to implement on a basin-wide scale. A numerical rating system for reach habitat parameters is suggested as a means of standardizing the habitat evaluation process.

391 (068442)
HORLER, A.; JOHNSTON, R.A.C.; CRONKITE, G.M.W. * ***An assessment of the fisheries resource in 18 lakes within the Yukon Territory, Canada*** * Department of Fisheries and Oceans, Whitehorse, YT * Dec 1983 * 160p * (Yukon River Basin Study Project Report: Fisheries, No 4)

This report presents the results of an inventory of fish resources within 18 lakes of the Yukon Territory conducted during 1982 and 1983 in order to further the understanding of the basic biology, structure and management requirements of Yukon fish populations. Netting programs recorded ten species, with whitefish and lake trout comprising the major portion of the overall catch. Most lakes were similar in terms of species diversity. Biological information related to size, condition, age, sex composition, maturity and growth was compiled for each population by lake and by species. The potential of certain lakes to support faster growing fish was assessed and confirmed for some species.

Rates of growth were compared between lakes, and age at maturity was determined. A management strategy for Yukon lakes is proposed and a method for developing interim harvest levels for lakes lacking all required information is also presented. Recommendations for further investigations are suggested.

392 (069822)
MILLIGAN, P.A.; RUBLEE, W.O.; CORNETT, D.D.; JOHNSTON, R.A.C. * ***The distribution and abundance of chinook salmon (Oncorhynchus tschawytscha) in the upper Yukon River Basin as determined by a radio-tagging and spaghetti tagging program : 1982-1983*** * Department of Fisheries and Oceans, Whitehorse, YT * 1984 * 140p * (Yukon River Basin Study Technical Report: Fisheries, No 5a)

A two-year study of the distribution and abundance of adult chinook salmon within Canadian portions of the Yukon River Basin was conducted in 1982-83. Spaghetti tags were applied to 265 chinook in 1982 and 1 266 chinook in 1983 as part of a mark-recapture program. Radio transmitters were implanted in 130 chinook in 1983. Population estimates of 36 598 and 47 741 chinook were determined for 1982 and 1983, respectively. The overall chinook exploitation rate for the commercial, native subsistence, and domestic fisheries in the study area was 35.1% in both 1982 and 1983. Five, six and seven year old chinook were the dominant age classes harvested in the commercial fishery in the Yukon Territory. Naturally occurring chinook stocks spawned in 61 streams within the study area. Spawning habitat included main stem area, both small and large tributaries, and lake outlets. The number of new spawning areas identified in this study was lower than anticipated. Many of the spawning areas identified are underutilized at the present time and many existing chinook populations appear to be remnants of larger historic returns. It appears that Canadian spawning areas produce approximately 50% of the Yukon chinook salmon resource. This report recommends that the Department of Fisheries and Oceans initiate joint management and research with the Alaska Department of Fish and Game as Canadian-bound chinook stocks are intercepted in Alaskan fisheries on the lower Yukon River during their upstream migration.

393 (069821)
MILLIGAN, P.A.; RUBLEE, W.O.; CORNETT, D.D.; JOHNSTON, R.A.C. * ***The distribution and abundance of chum salmon (Oncorhynchus keta) in the upper Yukon River Basin as determined by a radio-tagging and spaghetti tagging program : 1982-1983*** * Department of Fisheries and Oceans, Whitehorse, YT * 1984 * 128p * (Yukon River Basin Study Technical Report: Fisheries, No 5b)

A two-year study of the distribution and abundance of adult chum salmon within Canadian portions of the Yukon River Basin was conducted in 1982-1983. Spaghetti tags were applied to 1 082 chum in 1982 and 3 176 chum in 1983 as part of a mark-recapture program. Radio transmitters were implanted into 114 chum in 1982. Radio-tagged chum were tracked into three of the five sub-basins located within the study area. Population estimates of 47 049 and 118 365 chum were determined for 1982 and 1983, respectively. The 1983 estimate was the largest recorded for the upper Yukon River Basin. The overall chum exploitation rates for the commercial, native subsistence and domestic fisheries in the study area were 26.2% in 1982 and 23.7% in 1983. Chum return to spawn at three to six years of age, although four and five year old chum are the predominant age classes. The magnitude of the 1983 chum return suggests that upper Yukon chum stocks follow a four-year cycle pattern. The results of this study indicate that chum spawning sites in the upper Yukon River Basin are frequently associated with upwelling groundwater areas found in side channels. Also, Canadian spawning areas produce about 50% of the total Yukon River drainage production. It is recommended that the Department of Fisheries and Oceans initiate joint management and research with the Alaska Department of Fish and Game as Canadian-bound chum stocks are intercepted in Alaskan fisheries on the lower Yukon River during their upstream migration.

394 (070758)
HORLER, A.; JARVIS, M.E.; JOHNSTON, S. * ***Creel census study on Fox, Marsh, and Tagish lakes in the Yukon Territory 1983*** * Department of Fisheries and Oceans, Whitehorse, YT * June 1984 * v, 46p

Creel census and sampling programs were conducted in 1983 at Fox, Marsh and Tagish lakes in the Yukon Territory. The data collected included angler catch, effort, success rate and place of residence, as well as the composition of the catch in terms of species, size, age and sex.(au)

395 (068247)
CHUDYK, W.E. * ***Some notes on the 1983 sport fishery, Atlin Lake, B.C.*** * BC Ministry of Environment, Fish and Wildlife Branch, Skeena Region * Dec 1983 * 12p * (Yukon River Basin Study Project: Fisheries, No 7)

This study of the sport fishery of Atlin Lake presents detailed information on angler origin and distribution in the fishery, their catch and effort expended. Life histories of Atlin Lake trout and Arctic grayling are also investigated. The study area is described and the survey methods are outlined. Results of the survey indicate that the Atlin Lake sport fishery consists predominantly of Atlin residents. The lake trout sport fishery is concentrated in the area immediately surrounding the town of Atlin and in Torres Channel from the middle of June through August. Spawning sites should be researched and protection given as required. Preliminary data indicate that the fishery is healthy. As 1983 was somewhat atypical, additional creel census is required.

396 (067524)
PENDRAY, T. * ***Life history and habitat utilization of Arctic grayling (Thymallus arcticus) in two central Yukon drainages*** * Yukon Department of Renewable Resources Whitehorse, YT * Nov 1983 * 44p * (Yukon River Basin Study Project Report: Fisheries, No 8)

A study to investigate the life history and movements of Arctic grayling (Thymallus arcticus) was carried out in the Stewart River drainage near Mayo, Yukon, during spring and early summer of 1983. Grayling movements and spawning utilization were monitored in two tributaries in the South McQuesten and one tributary to the Mayo River as well as in the main stems at the mouths of these streams. No grayling spawning was detected in the smaller tributaries during the study. Spawning appeared to occur in both main stems at approximately the same time and water temperature. Spawning began about May 15 at a water temperature of 5°C and ended approximately May 31. Very large numbers of grayling of all age classes migrated into a South McQuesten River tributary from the main stem throughout June and early July. Over 1000 adult and sub-adult grayling (i.e. greater than approximately 200 mm) were captured while moving upstream at a weir on Lynx Creek during this period. A summer rearing population of approximately 11 000 grayling was estimated for an 18-km section of Lynx Creek from mark-recapture data. Grayling from the Mayo River population were significantly larger than those from the South McQuesten population for a given age class. Growth in South McQuesten fish was slow, especially for ages 1-3 years. The maximum observed age for South McQuesten grayling was 15 years. Grayling matured first in both areas at age 5. The majority of fish were mature at age 6 in the Mayo population and at age 7 or 8 in the South McQuesten population.

397 (068517)
MCLEAY, D.J.; ENNIS, G.L.; BIRTWELL, I.K.; HARTMAN, G.F. * ***Effects on Arctic grayling (Thymallus arcticus) of prolonged exposure to Yukon placer mining sediment: a laboratory study*** * Department of Fisheries and Oceans, Habitat Management Division, Field Services Branch, Vancouver, BC * Jan 1984 * 96p * (Yukon River Basin Study, Fisheries Project Report, No 9)

The effects on underyearling Arctic grayling (Thymallus arcticus) of a 6-week exposure to differing strengths of suspended placer mining sediment was examined under controlled laboratory conditions during the summer of 1983. This report describes the materials and methods used and discusses the results of the study. It was concluded that, whereas chronic exposure of Arctic grayling to suspended sediment concentrations of less than or equal to 1000 mg/L may not cause direct mortalities of fish or impair their respiratory capabilities, suspended sediment strengths above 100 mg/L causes a number of serious sublethal effects including impaired feeding ability, reduced growth rates, downstream displacement, decreased scope for activity and decreased resistance to other environmental stressors. The environmental relevance of these findings is discussed.

398 (071426)
DEBICKI, R.L. * ***Placer mining industry in Yukon and Atlin mining division, British Columbia*** * 29 Feb 1983 * 220p * (Yukon River Basin Study Project Report: Placer No 1)

This report contains information on aspects of the placer mining industry in the Canadian portion of the Yukon River Basin. Information concerning the history of the industry is summarized, and a list of references to many creeks on which placer activity has occurred is included. Regulatory regimes governing property acquisition, mining, and rehabilitation in British Columbia and the Yukon are summarized; those in Alaska are summarized for the sake of comparison. Location maps showing the distribution of placer dispositions as of January 1, 1981, and of mining operations between 1978 and 1982 are included; legends list the names of operators and the years in which they were active. The types of placer deposits found in the Yukon River Basin and the methods of mining, processing, and treating wastes from such deposits are described, as are the economic factors which affect the viability of mining operations. Gold production from the Yukon Basin is listed as well as information indicating the importance of certain creeks relative to others as producers. The implications of information presented in this report on the role of the placer mining industry in the economy of the Yukon River Basin region and its future are considered. The project report is concluded by a comprehensive bibliography of reports concerning placer deposits, placer mining and processing methods, and the placer mining industry in the Yukon River Basin.

399 (067526)
UNDERWOOD MCLELLAN LTD. * ***Yukon River Basin flood risk study*** * Environment Canada, Inland Waters Directorate * Oct 1983 * vp * (Yukon River Basin Study, Hydrology Work Group Report No 1)

This report describes a study to assess the risk of flooding in the Yukon River Basin. The objectives of the study were to provide a general overview of flooding in the basin, identify flood-prone areas, determine the causes of flooding, assess the flood control benefits to be derived from reservoir storage or diversion schemes and to recommend flood forecasting techniques. The report describes the study area and presents some hydrological data. The hydraulics of the river channel are described, and causes of flooding are reviewed including spring runoff, rainstorm events, glacier melt and ice jams. Historic flood events are described and flood forecasting and flood damage reduction are discussed.

400 (068249)
JANOWICZ, J.R. * ***Yukon River Basin hydrometeorologic data network assessment*** * Department of

Indian Affairs and Northern Affairs, Northern Affairs Program, Water Resources Division, Whitehorse, YT * Mar 1984 * 165p * (Yukon River Basin Study, Hydrology Report No 2)

The various hydrometeorological data collection networks within the Yukon River Basin have been assessed to determine their adequacy for providing baseline and site specific data. The networks considered were the hydrometric networks operated by Water Survey of Canada (WSC) and the Yukon Region of the Department of Indian Affairs and Northern Development (DIAND), the meteorological network operated by the Atmospheric Environment Service (AES), and the snow course network operated by the British Columbia Ministry of Environment and DIAND. Study objectives were achieved by identifying data gaps and stations which are redundant or otherwise deficient in terms of location or instrumentation. Both qualitative and quantitative techniques were used in assessing the adequacy of the data collection networks. The qualitative approach included a subjective evaluation of the spatial distribution of the respective networks. Present and future site-specific requirements were assessed through the consideration of existing and potential major developments which included mining and hydroelectric developments, linear facilities and recreational uses. Previous studies were reviewed, as well as the policies and mandates of the respective agencies, and the history of network development in the basin. The quantitative approach consisted of a statistical evaluation based on a regionalization procedure. This was carried out on the WSC hydrometric network only. The basin was delineated into regions of homogeneous hydrologic response. A correlation analysis was performed on all stations within the established regions with the intent of identifying pairs of stations which are highly interrelated. Specific recommendations have been made to satisfy the identified deficiencies. These are summarized in a tabular form.

401 **(068367)**

YUKON RIVER BASIN COMMITTEE * ***Yukon River daily hydrologic flow model*** * Environment Canada, Environmental Conservation, Inland Waters Directorate, Pacific and Yukon Region, Vancouver, BC * Mar 1984 * 123p * (Yukon River Basin Study, Hydrology Report No 3)

This report describes the results of Project #44, "Daily Hydrologic Flow Model" of the Yukon River Basin Study, carried out jointly by Canada, Yukon and British Columbia. The report is a guide to the use of a hydrologic flow routing model for the Yukon River in Canada that computes downstream effects on river discharges and elevations resulting from operation of existing or proposed water resources projects upstream. The model simulates these effects using mean daily discharges in the SIMPAK computer program. Further detailed information regarding the SIMPAK program is available from the Inland Waters Directorate. The first three chapters of the report introduce readers to the SIMPAK program by describing its capabilities, its usual configurations and modes of operation. Descriptions of procedures to set up and revise a model are also provided. The remaining chapters each describe a portion of the basin model and provide relevant information required to run the model. Also included as appendices are descriptions of field surveys in the headwater lakes portion of the basin. The data obtained from the surveys will be useful in refining the Marsh, Tagish and Bennett lakes portion of the model.

402 **(070071)**

GERARD, R. * ***Yukon River freeze-up and break-up study*** * Environment Canada, Environmental Conservation, Inland Waters Directorate, Pacific and Yukon Region, Vancouver, BC * June 1984 * vi, 110p * (Yukon River Basin Study Hydrology Report, No 4)

This report describes results of Yukon River Freeze-up and Break-up studies. The report discusses general characteristics of the Yukon River Basin as they relate to the river ice regime, describes the salient ice processes characteristic of the area, reviews historical information on the ice regime and presents the findings of surveys that were undertaken during 1982 and 1983 to monitor the break-up and freeze-up conditions between Lake Laberge and the Yukon-Alaska border. It also discusses generally the effects on the ice regime that might occur as a result of future river regulation for hydroelectric generation purposes.(au)

403 **(070971)**

SHORTREED, K.S.; STOCKNER, J.G. * ***Limnology of selected lakes in the Yukon River Basin*** * Department of Fisheries and Oceans, Fisheries Research Branch, West Vancouver, BC * Dec 1983 * i, 34p

Limnological investigations were carried out on 19 Yukon River Basin lakes in the summer of 1982 and in the early spring of 1983. A wide range of limnological variables were measured, including light, temperature, water chemistry, bacterioplankton numbers, phytoplankton biomass and species composition, and zooplankton biomass and species composition. On the basis of average phosphorus concentrations, the lakes were oligotrophic to mesotrophic, and the range in average bacterioplankton numbers indicated that several lakes were approaching eutrophy. In most lakes average zooplankton biomass was high (range: 22-202 mg dry wt/m^3, further indicating the productive nature of these lakes. The utility of these data in developing fish yield models for Yukon lakes is discussed, and areas requiring additional research are suggested.(au)

404 **(070133)**

STABLER, J.C.; OLFERT, M.R.; TOLLEY, G. * ***Input-output for Yukon and Yukon River Basin*** * Dec 1983 * 111p

This report describes the input-output tables for the Yukon, the adjustments made to them, and the resulting tables for the Yukon River Basin. The development of a model specifically for the Yukon is discussed in the context of both theoretical considerations and practical constraints imposed by data availability,

quality or form. The development of an energy component for use in conjunction with the input-ouput model is also described. The methodology used and additional data sources required in preparing the Yukon River Basin tables are presented as well as the technique and data sources employed in the creation of the placer mining sector. A specific example of a hypothetical change in the magnitude and composition of final demand is developed and interpretations and precautions associated with the use of input-output as a tool for forecasting are pointed out. Finally, the output and income multipliers which derive from the Yukon and Yukon River Basin models are developed and explained.

405 **(070132)**

Yukon input-output computer programs : volume II * Nov 1983 * 146p

This volume presents an overview of the technical details pertinent to operation of the Yukon input-output computer programs, IMPACN.FOR and PHYSIN.FOR. IMPACN.FOR allows the user to interactively modify one or more final demand values and have the new transactions table produced. A flow chart shows interrelationships among data sets and three sample terminal sessions illustrate how IMPACN.FOR is used.

406 **(068802)**

REAUME, D.M. * ***The Economic, Cohort-Survival and Energy Models*** * Department of Economic Development and Intergovernmental Relations, Government of Yukon, Whitehorse, YT * June 1983 * 145p * (Yukon River Basin Study Report, Project Report: Yukon Economic Model)

NEWYEM model, consisting of three models pertaining to the Yukon (the economic model proper, the cohort-survival population model, and the sector-end use-fuel specific energy demand model), is described with emphasis on the economic model which captures both financial and nonfinancial determinants of economic growth. Sectors constituting the model are discussed including employment in mining, forestry, construction, services, transportation, communications and utilities, federal government, territorial government, local government and other, income and consumption population and labor force, and housing/bank deposits. NEWYEM's ability to measure accurately the multiplier effects of new economic stimuli is improved by the inclusion of a broad array of employment determinants in the employment equations. The method used to estimate these equations is ordinary least squares, subject to imposed point constraints on certain parameters. Documentation for all three models is contained in this report.

407 **(068248)**

ALASKA ECONOMICS INC. * ***Economic growth in Yukon 1983 to 2003*** * 22 Feb 1984 * 163p * (Yukon River Basin Study Project Report: Socio-Economic No 4)

This report considers future economic growth in the Yukon and presents an analysis of the structure of the Yukon economy which is largely dependent for its existence on government, mining, and tourism. The economic performance in the region between 1972 and 1982 is reviewed. Activities in the field of metal mining are outlined with information on metal prices, producers, principal uses, and projected long-term growth rates for several minerals. The impact of mining, tourism and government on the Yukon economy is discussed, and four views of the Yukon's long-term economic prospects are described. The four simulations were made with the NEWYEM econometric model. The rationale for government investment in special development projects is considered and environmental consideration including water demand are discussed.

408 **(070131)**

THOMPSON, A.R.; RUEGGEBERG, H. * ***Water management in the Yukon Territory : integration with land use planning*** * Mar 1984 * 44p * (Yukon River Basin Study Project Report: Socio-Economic, No 5a)

This study examines the requirements of an effective water management regime and how water planning can best be undertaken in the context of an overall land use planning process in the Yukon Territory. An overview is presented of the importance of the Yukon River Basin and of the water use conflicts that have surfaced in recent years. A summary is given of federal legislation dealing with the water resources of the Yukon River Basin including the Northern Inland Waters Act which established the Water Board. The development and organization of a land use planning process is described and the roles of the federal government, the Yukon Water Board, the Yukon Territorial government and the Council for Yukon Indians in the planning process are outlined. Several options are presented for involving the Yukon Water Board in the proposed land use planning process, and factors to be considered in the process of integrating planning and water licensing are discussed.

409 **(070129)**

FOX, I.K. * ***An assessment of legal and administrative arrangements related to placer mining in the Yukon River Basin*** * Mar 1984 * 23p * (Yukon River Basin Study Project Report: Socio-Economic, No 5b)

Existing legal and administrative structures and procedures for the regulation of placer mining in both the Yukon Territory and British Columbia portions of the Yukon River Basin are described and assessed, and suggestions are made for resolving existing problems. Problems that have arisen in the Yukon over placer mining include lack of provision in the Placer Mining Act for coordination with other resource uses; exemption of placer mining from regulation under the Territorial Lands Act; uncertainty as to the regulation of placer mining operations affecting water resources; questioning of the validity of using guidelines as a basis

for granting rights to use water; and problems with the Fisheries Act and its administration. In order to resolve existing difficulties, it is suggested that all interested parties negotiate modification of the existing regulatory process. Major elements of an acceptable regulatory arrangement are described, and it is concluded that, for the most part, existing legislation would not prevent the inclusion of the proposed features.

410 (070125)
THOMPSON, A.R.; OURCM, A. * ***Legal and administrative arrangements for Yukon River Basin water management*** * Mar 1984 * 81p * (Yukon River Basin Study Project Report: Socio-Economic, No 5c)

An overview is presented of the legal and administrative arrangements for water management in the Yukon River Basin. Powers respecting the basic allocation and management of water rights in the British Columbia and Yukon Territory portions of the basin are explained. Legislation applicable to the allocation of water resources in both portions of the basin is discussed as well as legislation regulating water quality within the basin. Aspects of both provincial and federal legislation controlling water use activities in the basin are described and international agreements governing water use are briefly considered.

411 (070130)
FOX, I.K. * ***An assessment of institutional arrangements in the Yukon River Basin for planning, constructing and operating hydroelectric power facilities*** * Mar 1984 * 29p * (Yukon River Basin Study Project Report: Socio-Economic, No 5d)

The laws, organizations and procedures relating to the planning, construction and operation of hydroelectric power facilities in the Yukon River Basin are discussed. The institutional issues related to hydroelectric power development that arise in British Columbia and the Yukon Territory are defined and their implications for the design of institutional arrangements for water management in the two jurisdictions are assessed. Existing practices dealing with electric power planning in the Yukon are outlined and their shortcomings examined. In a discussion of hydroelectric power planning and development in the British Columbia portion of the Yukon River Basin, the two hydroelectric power potentials considered are the regulation of storage in Atlin Lake and the Taku River diversion. The need or lack of need for arrangements for cooperation between British Columbia and the Yukon Territory in developing and managing hydroelectric power resources of the Yukon River Basin is considered as well as the necessity for similar arrangements between Canada and the United States.

412 (070126)
PAISH, C. * ***Tourism, parks and recreation in the Yukon River Basin : descriptive synthesis : Volume I : main report and bibliography*** * Yukon Department of Renewable Resources, Whitehorse, YT * 31 Apr 1984 * xxv, 213p

This document presents a synthesis and analysis of available information on tourism, parks and recreation in the Yukon River Basin. A comprehensive review of existing data sources was carried out, and representatives of government, private groups, businesses and individuals involved in tourism, parks and recreation were interviewed. Existing and potential conflicts and compatibilities between tourism, parks and recreation, and other water uses, users and developments which may affect water were examined, the most prominent being hydroelectric development, back country access and placer mining. Issues and concerns related to water-based tourism, parks and recreation that were raised during the course of the study are summarized. A detailed bibliography is divided into four sections: literature bibliography; detailed cottaging bibliography; map bibliography; and agency and individual contacts. Where possible a retrieval location is listed.

413 (070728)
Tourism, parks and recreation in the Yukon River basin : descriptive synthesis : Volume III: appendices * 31 Apr 1984 * 104p

The appendices contain recommendations from the Wilderness/Adventure Travel Study and Industry Overview and Development Strategy; the summaries and recommendations from tourism development plans for Atlin region, Dawson, Whitehorse and Kluane region; theme and map information from a Concept Plan for the Yukon River and related studies; and historic sites inventory and evaluation; a summary of craft-related, water-based recreational activities in the basin; a proposed management strategy for Yukon lakes; the conclusions and recommendations from The Yukon Sport Fishery; and a summary of recreational capacity of sub-basins in the Yukon River Basin.

414 (068848)
REID CROWTHER & PARTNERS LIMITED * ***Inventory, analysis and evaluation of the recreational capability of the Yukon River Basin, Volume 1, Main report*** * Nov 1983 * vp

Volume I, the main report of the Yukon River Basin Study, is a summary or synthesis statement of the whole study and outlines present and future conditions affecting water-based recreational use in the river basin. It also provides a description of priority management areas, indicates areas of data deficiency and suggests future directions for policy decisions related to water-based recreation in the basin. The inventory component was designed to identify those lakes and rivers in the basin that currently support some form of water-based recreation, to describe the qualitative features associated with those lakes and rivers, and to quantify, if possible, current recreational usage at each site. The development of an analytical framework used to develop comparative ratings of recreation capability for each river and lake is described. The reliability of study results is evaluated and any limitations to the analysis are identified by reviewing the methodologies employed in this study and the problems associated

with these models. Sub-basins described include lower Yukon River, Stewart River, Pelly River, White River, Teslin River and upper Yukon River.

415 (068846)
REID CROWTHER & PARTNERS LIMITED * ***Recreational atlas of the lakes and rivers within the Yukon River Basin, Volume II*** * Nov 1983 * vp

Volume II of the Yukon River Basin Study contains 32 maps outlining existing and proposed forms of recreational use, historical features, wildlife concerns and recreational potential. With the exception of wildlife, all map sheets have been prepared by sub-basin (lower Yukon River, Stewart River, Peely River, White River, Teslin River, and upper Yukon River), making possible a detailed presentation of study results in map form. A number of sites/areas supporting major wildlife species associated with water bodies have been identified and are referred to on the Ecological Sites/Areas Map sheet. Those areas either having the potential or experiencing a high frequency of bear problems are also indicated on this map sheet.

416 (068845)
REID CROWTHER & PARTNERS LIMITED * ***Inventory of the recreational capability of the lakes and rivers within the Yukon River Basin, Volume III*** * Nov 1983 * 301p

Volume III of the Yukon River Basin Study presents recreational inventory data sheets for all water bodies which have recognized geographical names and exceed two kilometers in length. These are broken down alphabetically by sub-basin including lower Yukon River, Stewart River, Pelly River, White River, Teslin River and upper Yukon River. For each river and lake, an assessment is made of the key components which affect the recreational potential of a given water surface. Each water body data sheet contains the information on location and accessibility; suitability, including conflicting uses, navigability, portages, water level fluctuations, and hazards; recreational values, including scenic quality, natural features, historic features, information availability, services and facilities, and primitive campsite availability; wildlife capability, waterfowl capability, fishing capability, and water quality; craft suitability, including white water craft, recreational canoe, power boat, and sail boats; and recreational potential.

417 (068847)
REID CROWTHER & PARTNERS LIMITED * ***Evaluation of the recreational capability of the lakes and rivers within the Yukon River Basin, Volume IV*** * Nov 1983 * vp

Volume IV of the Yukon River Basin Study contains the quantitative assessments used to generate Volume III which contains the recreational inventory data sheets presenting a comprehensive analysis of the recreational potential of the water surfaces of the Yukon River Basin. This present volume contains the numerical values discussed in qualitative terms in Volume III and serves as the numerical starting point for the resource manager for completing a recreation inventory and evaluation of the recreational capability of new water bodies or modifying old evaluations, as new data become available. The sub-basins covered in the study are lower Yukon River, Stewart River, Pelly River, White River, Teslin River, and upper Yukon River. Assigned recreational potential are calculated from accessibility, suitability, craft suitability, and recreational values, outlined in Volume III.

418 (068843)
HOWARD PAISH & ASSOCIATES LTD. * ***A physical description of lakes and rivers in the Yukon River Basin*** * Feb 1984 * 2v

This two-volume report provides a physical description for lakes and rivers in the Yukon River Basin necessary to permit an independent assessment of recreational capability and potential by appropriate management agencies. The information provided complements Volumes 2-4 of the Inventory Analysis and Evaluation of the Recreation Capability of the Yukon River Basin carried out by Reid Crowther & Partners Ltd. as part of the Yukon River Basin Study. One-page data sheets on existing physical and descriptive information on individual lakes (Volume 1) and rivers (Volume 2), are provided. Basic information provided includes name and drainage, location, access types, size or length, site description, vegetation, hydrologic characteristics, fishery features, landscape aesthetics, existing uses, recreational capability, recreational potential, and source of data.

419 (068433)
JACK, M.E.; OSLER, T.R.; BURNS, B.E. * ***Water quality - Yukon River Basin*** * Department of Indian and Northern Affairs Canada, Northern Affairs Program, Whitehorse, YT * Dec 1983 * vp * (Yukon River Basin Study, Water Quality Work Group Report No 1)

Baseline water quality data were collected at 21 stations on the Yukon River main stem and headwaters and on its major tributaries which included the Klondike, White, Stewart, Pelly, Teslin and Takhini rivers. At each station, field measurements were made of pH, conductivity, air and water temperature, and water samples were taken for laboratory analysis of pH, conductivity, residues, nutrients, major cations and total metals. Sampling frequencies ranged from weekly to quarterly but were consistent at each station. All data is included in the appendix. The study included a reconnaissance study at each site where samples were taken on a transect of the river for site selection; 13 months of monitoring at each station for baseline data collection; a quality control study to check the validity of the data; and a mercury study to measure mercury concentrations in the Pelly River near Faro. The baseline data collected was evaluated for general water quality and was analysed statistically to determine optimum sampling frequency. Weekly monitoring was recommended.

420 (068443)
WHITFIELD, P.H. * ***Optimization of water quality monitoring in the Yukon River Basin*** * Environment Canada, Environmental Conservation, Inland Waters Directorate, Pacific and Yukon Region, Vancouver, BC * (1984) * 28p * (Yukon River Basin Study, Water Quality Work Group Report No 2)

A method for determining optimum sampling frequencies for the determination of long-term trends is described. This method uses the following approach: using data collected at regular intervals, determining the coherence of that series and the redundancy of that series. An optimized sampling frequency maximizes the coherence of the series while minimizing the amount of redundant data gathered. The theoretical basis for the approach and the application to data collected in the Yukon River Basin Study are described.

421 (068375)
WHITFIELD, P.H.; MCNAUGHTON, B. * ***Comparison of dissolved oxygen processes under ice in two southern Yukon rivers*** * Environment Canada, Environmental Conservation, Inland Waters Directorate, Pacific and Yukon Region, Vancouver, BC * (1984) * 63p * (Yukon River Basin Study, Water Quality Work Group Report No 3)

Processes affecting the concentration of dissolved oxygen under winter ice cover were studied during the winter of 1982-1983 in the Nordenskiold and Takhini rivers. Oxygen levels in both rivers became depleted during the winter, with the depletion of oxygen being most severe in the organic-rich Nordenskiold River where oxygen concentrations dropped to 50% saturation. The development of these depressions appears to be related to both biological and physical processes. The manner in which the ice cover forms on the river affects the development of dissolved oxygen depressions. Inputs of ground water are important in determining the ultimate level that the depression reaches. Levels of dissolved oxygen decrease most rapidly during the period of ice cover formation. About 80% of the total depression which ultimately occurs happens within the first week of ice cover. Levels of dissolved oxygen return to the saturation level prior to the decay of the ice cover. Once the snow cover present on the surface of the ice is gone, allowing light penetration to occur, oxygen levels show substantial increases. The level of organic carbon appears to enhance the depression of oxygen.

422 (068462)
MCNAUGHTON, B. * ***Field equipment and procedures for water quality measurements under ice*** * Environment Canada, Environmental Conservation, Inland Waters Directorate, Pacific and Yukon Region, Water Quality Branch, Vancouver, BC * nd * 29p * (Yukon River Basin Study, Water Quality Working Group Report No 4)

A study of dissolved oxygen under winter ice cover was part of the work conducted on the Yukon River Basin in 1982-83. The occurrence of dissolved oxygen depressions under winter ice was examined and the processes involved were investigated. Water samples were collected each month from August 1982 to May 1983 at stations located on the Takhini and Nordenskiold rivers. Since field work was scheduled during the winter season when temperatures could be as low as -60°C, special preparations were needed to ensure proper functioning of the equipment. Additional equipment was required to drill or cut through the ice and to protect scientific equipment from sub-zero degree temperatures. This report describes the special equipment and sampling methods required for the continuous monitoring program and for the under-ice collection of water samples.

423 (068374)
WHITFIELD, P.H. * ***Operation of the "Hydrolab" 8000 system for collection of water quality data*** * Environment Canada, Environmental Conservation, Inland Waters Directorate, Pacific and Yukon Region, Vancouver, BC * (1984) * 50p * (Yukon River Basin Study, Water Quality Work Group Report No 5)

This document describes experience with the "Hydrolab" 8000 system and some of the operational enhancements that have been developed by Water Quality Branch, Pacific and Yukon Region. The "Hydrolab" system has several features which are useful in field studies. It provides precise measurements of a limited number of water quality variables. It can operate as an unattended monitor or a survey instrument. The system components, aspects of the operation of each component, and details of the subsequent processing of logged water quality data are described.

424 (067522)
WATER QUALITY WORK GROUP * ***Bibliography of water quality information*** * Environment Canada, Environmental Protection Service * Dec 1983 * 9p * (Yukon River Basin Study Technical Report, Water Quality No 6)

This bibliography provides an overview of the amount and type of water quality information present from the Yukon River Basin. It identifies studies done in other watersheds with similar conditions which would relate to processes occurring in the Yukon River Basin that may influence water quality.

425 (067525)
SLOUGH, B.G.; JESSUP, R.H. * ***Furbearer inventory, habitat assessment and trapper utilization of the Yukon River Basin*** * Yukon Department of Renewable Resources, Whitehorse, YT * Jan 1984 * 87p * (Yukon River Basin Study Project Report: Wildlife No 1)

Furbearer inventory studies conducted in the Yukon River Basin in 1982 and 1983 included beaver food cache and colony site surveys, winter track-count sampling and muskrat pushup surveys. Data from the surveys were analyzed in conjunction with ongoing trapper questionnaire and historical fur harvest data sources to characterize furbearer population

distributions, levels, trends and habitats. Historical and present fur harvest and trapping activity are described. The resource capability and problems and issues associated with impacts on furbearer populations, habitats and user groups are discussed. The populations of wolves, red fox, coyote, red squirrel, weasel, marten, mink, otter, wolverine, beaver, muskrat and lynx are all widely distributed within the Yukon River Basin. Two major prey species, grouse and snowshoe hare were also monitored during the studies. Potential impacts on furbearer populations and trapping activities include permanent or temporary habitat loss, air and water pollution, and disturbance. Permanent habitat loss is seen as the most severe impact, and hydroelectric development as the scenario threatening the greatest habitat loss. An annotated bibliography and information summary on the furbearer resource and trapping industry of the Yukon River Basin are also included.

426 (068435)
SMITS, C.M.M. * ***An annotated bibliography and information summary on the furbearer resource and trapping industry of the Yukon River Basin*** * Yukon Department of Renewable Resources, Wildlife Management Branch, Whitehorse, YT * Dec 1983 * 168p * (Yukon River Basin Study Project Report: Wildlife No 1, Appendix 2)

Listed are 154 summarized reports dealing with furbearers, the trapping industry and small mammals, pertaining to the Canadian portion of the Yukon River watershed (exclusive of the Porcupine River). A number of references not received in time to be annotated are listed separately. Sources include government and industrial technical reports, periodicals, university theses and books.

427 (068475)
JOHNSTON, W.G.; LARSEN, D.G.; MCLEOD, H.A.; MCEWEN, C.A. * ***Moose population dynamics and habitat use, southern Yukon River Basin*** * Yukon Department of Renewable Resources * May 1984 * 60p * (Yukon River Basin Study Project Report: Wildlife No 2)

This report is a compilation of recent moose inventories in the southwest Yukon based on early winter moose population size; the age and sex composition of moose populations during the early winter period; early and late winter distribution of moose; and early and late winter moose habitat use.

428 (070123)
MOSSOP, D.; COLEMAN, T. * ***Factors affecting the fall staging of waterfowl at Nisutlin Delta, Yukon*** * Yukon Department of Renewable Resources * Feb 1984 * 57p * (Yukon River Basin Study Project Report: Wildlife, No 3)

A study was conducted in the Nisutlin River Delta to examine the fall staging habitat and waterfowl survival strategy occurring there, and to identify and measure components of the system which may be sensitive to management in the future. The feasibility of extrapolating the results to similar systems throughout the Yukon River Basin was considered. Waterfowl populations using the delta were identified as well as their numbers and timing of use. Important habitats of the delta were identified and the specific use being made of various parts by birds was determined. The interrelationships between water level changes and various habitats used by waterfowl were examined, and waterfowl behavioral strategies used during staging were identified. A detailed map of Nisutlin Delta vegetation classification is included with the report.

429 (068473)
JOHNSTON, W.G.; MCEWEN, C.A. * ***Spring staging of waterbirds at early open water sites in the Yukon River Basin*** * Environment Canada, Canadian Wildlife Service, Pacific and Yukon Region * Dec 1983 * 162p * (Yukon River Basin Study Project Report: Wildlife No 4)

Investigations of spring migrant waterbirds - loons, grebes, ducks, geese and swans - using early open water sites in the southern Yukon River Basin were conducted during two seasons of spring migration. During the second year, shore bird use of the sites was also investigated. The study assessed and compared the distribution and abundance of waterbirds at four intensively studied sites and at other open water sites identified during extensive aerial surveys; identified important areas and habitats to waterbirds within the intensive study sites; and assessed waterbird behavior at the sites and their use of available habitat. Intensive ground surveys of waterbird distribution, abundance, and habitat use and behavior at four open water areas were conducted in April and May of 1982 and 1983. Aspects of the physical and biological habitat available to spring migrants were assessed. This report describes the study area and methods used and outlines the results of the study.

430 (068474)
JOHNSTON, W.G.; MCEWEN, C.A. * ***Inventory of Canada Geese and other waterfowl on the Stewart, Pelly and Big Salmon rivers of the Yukon River Basin June-August 1982*** * Environment Canada, Canadian Wildlife Service, Pacific and Yukon Region * Mar 1983 * 54p * (Yukon River Basin Study Project Report: Wildlife No 5a)

Investigations of Canada geese and other waterfowl on rivers of the Yukon River Basin were conducted from June to August in 1982. The Stewart, Pelly and Big Salmon rivers were surveyed by air, and the Pelly and Big Salmon rivers were further surveyed on the ground and the Stewart by air for breeding, brood-rearing and moulting Canada geese and other waterfowl. The study assessed the distribution and abundance of Canada geese and other waterfowl on the rivers and associated wetlands, and identified and described areas of the rivers important to Canada geese and other waterfowl. A description of the study area is given and methods used in the study are outlined. Results of the study are reviewed in detail.

431 (068472)
MCEWEN, C.A.; JOHNSTON, W.G. * ***Inventory of Canada Geese and other waterfowl within the Yukon River Basin June-August 1983*** * Environment Canada, Canadian Wildlife Service, Pacific and Yukon Region * Dec 1983 * 74p * (Yukon River Basin Study Project Report: Wildlife No 5b)

Investigations of Canada geese and other waterfowl breeding and moulting on rivers of the Yukon River Basin were conducted from early June to mid-August during 1983. Ground surveys were conducted on the Morley, Swift and Teslin rivers and their associated wetlands. Two aerial surveys were conducted on the Stewart, Pelly and MacMillan rivers. The studies assessed the distribution and abundance of Canada geese and other waterfowl on the rivers and associated wetlands, and identified and described areas of the rivers important to Canada geese and other waterfowl. This report presents a detailed description of the study area, outlines the methods used and reviews the results.

ARCTIC OCEAN / OCÉAN ARCTIQUE

8. MACKENZIE RIVER BASIN / BASSIN VERSANT DU FLEUVE MACKENZIE

Final report / Rapport définitif

432 (F12279)
COMITÉ DU BASSIN DU FLEUVE MACKENZIE * ***Rapport d'étude du bassin du fleuve Mackenzie*** * Comité du bassin du fleuve Mackenzie * 1981 * 229p

Ce rapport rend compte d'une étude de l'eau et des ressources qui dépendent du bassin hydrographique du Mackenzie réalisée de 1978 à 1981. On y formule des recommandations à l'adresse des gouvernements participants, soit ceux du Canada, de l'Alberta, de la Colombie-Britannique, de la Saskatchewan, du Yukon et des Territoires du Nord-Ouest. Les ressources du bassin versant du Mackenzie sont importantes pour les habitants de cette région et pour le Canada dans son ensemble. Les conclusions et recommandations de ce rapport se fondent sur une vue d'ensemble du bassin et sur les résultats de l'étude de six grands sujets: un réseau de stations de mesure qui fournirait les données nécessaires pour établir un tableau complet de la quantité de l'eau du bassin, ainsi que de sa qualité; un modèle informatique du débit et du niveau de l'eau des principaux cours d'eau du réseau hydrologique du Mackenzie a été conçu; la débâcle printanière, la température de l'eau et la charge d'alluvions de la Liard et de ses tributaires ainsi que de leurs effets sur la débâcle du fleuve Mackenzie en aval du confluent avec la Liard; les écosystèmes alluviaux, où la flore riche et variée procure nourriture et abri à une faune diversifiée; un premier inventaire systématique des ressources naturelles et des caractéristiques hydrologiques du delta de la rivière des Esclaves; un premier inventaire systématique des ressources et des caractéristiques hydrologiques des dunes d'Athabasca en Saskatchewan.

433 (058018)
MACKENZIE RIVER BASIN COMMITTEE * ***Mackenzie River Basin study report*** * 1981 * 231p

This report describes a study of the water and related resources of the Mackenzie River Basin undertaken in 1978-1981, designed to increase understanding of these resources, their interdependencies, and the implications of water resource development in the basin. Recommendations arising from the study are addressed to the governments of Canada, Alberta, British Columbia, Saskatchewan, Yukon, and Northwest Territories, which participated in the project. Conclusions and recommendations are based on an overview of the basin and the results of six main study components: 1) a network of measuring stations is proposed which, if established, will provide the data for a coherent and comprehensive picture of the quantity and quality of water in the basin; 2) a computer model is developed for the flows and levels of the major rivers in the Mackenzie River system; 3) spring ice breakup activities are documented including the ice breakup, river temperatures and sediment loads of the Liard River and its tributaries and their influence on the Mackenzie River ice breakup below the Liard-Mackenzie confluence as well as ice jams, ice breakup mechanics and the breakup sequence; 4) alluvial areas where the highly productive ecosystems are described; 5) an inventory of the resources and hydrology of the Slave River Delta; and 6) a systematic inventory of the resources and hydrology of the Athabasca sand dunes. The main issue identified in the study is the need for future cooperation among the six governments in managing water.

Appendices and supplements / Appendices et suppléments

434 (059376)
MACKENZIE RIVER BASIN COMMITTEE * ***Sensitive areas: literature review, WATDOC references*** * Mackenzie River Basin Committee * 1981 * 380p * (Mackenzie River Basin study report, supplement 1)

This supplement contains the results of two studies undertaken as part of the Mackenzie River Basin Study Program. The first section, Sensitive areas: literature review, summarizes the available information on

37 areas within the Mackenzie Basin that could be expected to suffer in biological productivity and cultural or social value if changes occurred in the hydrologic regime. Each area summary contains a description of the hydrologic characteristics, natural resources (wildlife, fisheries, vegetation), socioeconomic considerations, sensitivity to hydrologic change, and knowledge gaps or data deficiencies, and concludes with a select bibliography. The information is current to December 1979, when the study was completed. The discussion of sensitivity was not intended to be and cannot be interpreted as an environmental impact statement. However, the summaries may be useful in planning baseline data gathering or environmental assessment work in these areas. The second section is a user guide to searching the AQUAREF bibliographic data base containing some 35 000 references pertaining to Canadian literature concerned with water resources and related environmental material. This includes the 1600 references and abstracts relating to the Mackenzie River Basin added during the study program. It is accessible throughout Canada on CAN/OLE.

435 (059375)
PETERSON, E.B.; ALLISON, L.M.; KABZEMS, R.D. * ***Alluvial ecosystems*** * Mackenzie River Basin Committee * 1981 * 129p * (Mackenzie River Basin study report, supplement 2)

This report was prepared under the 1978-1981 Federal-Provincial Agreement respecting the water and related resources of the Mackenzie River Basin. The terms of reference called for three steps: assembly of existing biophysical information from the Mackenzie River Basin, as well as from other major northward-flowing rivers in the circumpolar region, and evaluation of this information for relevance to the study; synthesis of information on relationships between physical and biological components of northern alluvial habitats, with particular attention to alluvial sites in the Mackenzie River Basin; and analysis and description of ecological processes involved in the natural creation, maintenance and loss of plant communities and wildlife habitats in the Mackenzie River Basin. This basin drains one-fifth of the total area of Canada. Spring breakup and the snowmelt flood are the major hydrological events of the year. Flooding and subsequent reductions of water levels are the key external forces that determine vegetation and productivity on the flood plains. Current information focuses on long-term trends such as ecological succession and with catastrophes and spectacular events such as high flood waters. Some less dramatic events, such as gradual lowering of water levels, are not well documented in relation to the life cycles and vitality of the plants and animals.

436 (059372)
WAROWAY, A.R. (ED) * ***Spring breakup*** * Mackenzie River Basin Committee * 1981 * vp * (Mackenzie River Basin study report, supplement 3)

This report was prepared under the 1978-1981 Federal-Provincial Study Agreement respecting the water and related resources of the Mackenzie River Basin. The spring breakup of the Liard River significantly influences the timing and severity of breakup of the Mackenzie River, and the Liard contributes large amounts of suspended sediment to the lower Mackenzie and its delta. A three-year program of baseline studies, during the breakup periods of 1978-1980, covers timing and progress of breakup, including ice thickness and the location and severity of ice jams; suspended sediment transport, including areas of erosion and deposition; water temperature and thermal mixing patterns; and breakup studies in the Mackenzie Delta during 1980. Contributed reports on the mesoclimate of the delta and on the breakup of the Athabasca and Peace rivers conclude this supplement. The major constraint of this study is that it yielded data only from low or near average flows. Monitoring and sediment sampling should be continued to verify the warmth of the Mackenzie River under various flows and to quantify the effect on temperature and flows of the various Mackenzie tributaries below the Liard River.

437 (059373)
Hydrometeorologic network design * Mackenzie River Basin Committee * 1981 * 101p * (Mackenzie River Basin study report, supplement 4)

This report is based largely on one prepared by Hydrocon Engineering (Continental) Ltd., in association with Reid Crowther & Partners Ltd. It was prepared under the 1978-1981 Federal-Provincial Study Agreement respecting the water and related resources of the Mackenzie River Basin. This basin drains one-fifth of Canada's area, and its management falls under the jurisdictions of three provinces, two territories, and the federal government. Recent major developments, plus proposed mega-projects influence its hydrologic regime. Consequently, more baseline data are needed for the determination of the hydrologic, sediment, meteorologic and water quality characteristics of the basin. Existing hydrologic networks tend to be incomplete and uncoordinated. The hydrometric, snow, meteorologic, water quality and sediment components were reviewed to evaluate available data, identify gaps, and propose stations to fill those gaps. This report summarizes those component studies and presents an overall coordinated network design. Of the existing stations, 445 were considered suitable for the baseline network; 158 new stations were identified, bringing the total baseline network to 603 stations.

438 (059374)
Hydrometeorologic network design: background reports * Mackenzie River Basin Committee * 1981 * vp * (Mackenzie River Basin study report, supplement 5)

This supplement comprises the background reports used in the development of a hydrometeorologic network design for the Mackenzie River Basin. These reports were prepared by several agencies over a period of a few years. The supplement is organized in five parts: a review of previous network studies;

hydrometric and snow course networks; meteorologic networks; water quality networks; and sediment networks. Each part, except the first, summarizes and describes all of the currently available hydrometeorologic data pertaining to the basin and evaluates existing networks. Gaps in the existing network are identified and tentative suggestions for closing the gaps are made.

439 (059378)
BODDEN, K. (ED) * ***Slave River Delta*** * Mackenzie River Basin Committee * 1981 * vp * (Mackenzie River Basin study report, supplement 6)

This supplement is a compilation of the final reports from each of the five study components which respectively investigated the historic development of the Slave River Delta, its hydrology, and its furbearer, fish and bird resources. The study was administered by the Water Resources Division of the Department of Indian Affairs and Northern Development (DIAND) in Yellowknife, and was conducted in accordance with the Memorandum of Understanding between Environment Canada, on behalf of the Mackenzie River Basin Committee, and DIAND of April 1, 1978. The delta was examined because of deficiency of baseline information needed to understand the relationship between its biological resources and hydrologic regime. Geomorphological changes were identified through analysis of a series of air photos and landsat images. Water samples were collected, and flow rates and levels recorded. Aerial surveys were used to determine the relative status of waterfowl species and muskrats and their habitats. Nets and live-traps collected specimens to tag and monitor species movement. Ground surveys determined habitat use and brood productivity of bird and muskrat populations. Lab analysis determined water quality parameters and ages and productivities of fish and muskrat. An additional 5 years of hydrologic records are needed before the hydrology of the delta can be adequately understood.

440 (059377)
SAWCHYN, W.W. (COORD.) * ***Athabasca sand dunes in Saskatchewan*** * Mackenzie River Basin Committee * 1981 * 335p * (Mackenzie River Basin study report, supplement 7)

The south shore of Lake Athabasca and the adjoining Precambrian sand plain are of particular hydrologic interest. The area's biological and geological uniqueness has prompted the proposal from time to time that it be made an ecological reserve or a provincial or national park. The objectives of this study were to characterize the terrain's physical, biological and cultural-historical components and to determine their interrelationships, thus contributing to a baseline assessment of the area's natural and heritage resources; and to evaluate the sensitivity of the area to man-induced changes, with particular attention to the likely effects of modifying the hydrological regime of the lake and its hinterland. This report is based on field data collected during 1979-80, as well as on air photo analysis and available literature.

441 (059371)
LYONS, R.O.; NEMANISHEN, W.; HOFER, R.D. (EDS) * ***Daily hydrologic model user manual*** * Mackenzie River Basin Committee * 1981 * 184p * (Mackenzie River Basin study report, supplement 8)

This report contains the Daily User Manual for the Mackenzie River Basin prepared by the staff of the Water Planning and Management Branch - Pacific and Yukon Region, Water Survey of Canada - Calgary office, and Water Planning and Management Branch - Western and Northern Region. A companion report to be used in conjunction with this is the SIMPAK Users Manual. The first three chapters of this manual, Introduction, SIMPAK Program Description, and Modeling with SIMPAK, introduce the user to the SIMPAK program, its capabilities and usual configurations. The remaining chapters each describe a sub-basin within the Mackenzie River Basin and provide a basin map, schematic diagrams for local and project models and routing parameters. Model configurations for the project and local inflow models are also provided. These sub-basins are included in the model package: Peace River, Bennet Dam to delta; Athabasca River, Hinton to Lake Athabasca; Peace-Athabasca Delta; Great Slave Lake; Liard River, Frances River to Fort Simpson; and Mackenzie River, Fort Providence to delta. The user may wish to interface the models to move the routed stream flows down the system. The sub-basin models include most active hydrometric stations in the sub-basins. If a detailed investigation is required of a specific location, the user may wish to model that portion of the stream separately for a more economical operation.

442 (069373)
Water Quality * Environment Canada, Inland Waters Directorate * 1985 * 201p * (Mackenzie River Basin study report, supplement 9; Water quality interpretive report, no 5)

This report describes the general state, seasonal and spatial trends of many physical, chemical, nutrient, metal and organic contaminant parameters of the major sub-basins of the Mackenzie River Basin. This is the only comprehensive assessment of water quality data that have been collected in the basin since the early 1960s by federal and provincial governments. The report recommends changes to the present monitoring design and strategy to reflect current requirements and water quality issues. Particular emphasis is given to sampling medium and frequency, uniformity of analytical techniques and basin coverage, with the intention of increasing the amount of information that can be obtained from the collected data.(au)

Miscellaneous reports / Rapports divers

443 (033294)
MACKENZIE BASIN INTERGOVERNMENTAL LIAISON COMMITTEE, TASK FORCE ON INFORMATION * ***Mackenzie River Basin reference binder*** * Environment Canada, Inland Waters Directorate, Western and Northern Region, Regina, Sask * nd * 372p

The reference binder contains nine sections. Section 1, introduction, provides the background to the formation and terms of reference of the Mackenzie Basin Intergovernmental Liaison Committee and its task forces. Section 2, basin geography, describes physical and climatic characteristics of the basin. Section 3, culture of the basin, provides a general description of cultural, social and economic conditions taken from data collection sources such as Statistics Canada. A listing of water management agencies with jurisdiction over the water resources of the basin is given in Section 4, institutional arrangements, as well as a listing of methods of allocating water use and legislation used for maintaining control over this resource. Section 5, resources of the basin, summarizes the economic resources available for extraction and utilization, including minerals, oil and gas, forests, fish, wildlife and water. A condensed description of active, planned and potential resource development is given in Section 6, resource development, focusing on developments in mining, oil and gas extraction, forestry, fishing, hunting and trapping, agriculture, power generation, manufacturing and tourism. Section 7, transportation and communication, covers modes of transportation and communication links between communities. A summary of network and inventory data available on water quantity and quality, meteorology, forestry, fish and wildlife, and an explanation of network deficiencies is given in Section 8, baseline environmental data. The last section, Section 9, contains information on the major research institutes conducting water resource research in the Mackenzie Basin and describes their programs. As well, some research programs not necessarily under the jurisdiction of these institutes are described if they are water- or environment-oriented.

444 (059195)
The Mackenzie Basin, Proceedings of the Intergovernmental Seminar held at Inuvik, N.W.T., June 24-27, 1972 * Environment Canada, Inland Waters Directorate, Ottawa, Ont * 1973 * 131p

The work of the Mackenzie Basin Intergovernmental Liaison Committee representing all the jurisdictions involved in the development of the Mackenzie River Basin - Alberta, British Columbia, Saskatchewan and the Yukon and Northwest Territories - is described, including what its member organizations have evolved in studies of the region to date. A brief outline of the basin, its geography, hydrology, natural resources, people and transportation, are described. Provincial and territorial interests are also detailed including principal interests of each province, principal centres of population, development responsibilities and potential for development. The work of the federal government through several departments and agencies and the Department of Indian Affairs and Northern Development, representing the Yukon and Northwest Territories, is described.

8.1 Peace-Athabaska River Basin / Bassin versant des rivières de la Paix et Athabaska

Final report / Rapport définitif

445 (018410)
PEACE-ATHABASCA DELTA PROJECT GROUP * ***The Peace-Athabasca Delta project, technical report*** * Peace-Athabasca Delta Project Group * 1973 * 176p

This technical report begins with a description of the setting of Lake Athabasca and the Peace-Athabasca Delta, followed by a brief outline of the intergovernmental investigations. The next four chapters cover the hydrologic, ecological socioeconomic and other investigations, and provide a summary of their results. This information is then integrated into an analysis of the conditions which resulted from the filling of Williston Lake and an examination of the projected long-term effects of reduced flows in the Peace River. Following this analysis, the report moves to the proposed remedial alternatives. Discussions of the legal framework, government coordination, and a summary of the appendices complete the technical report.

Summary report / Sommaire

446 (008007)
PEACE-ATHABASCA DELTA PROJECT GROUP * ***Peace-Athabasca Delta, a Canadian resource*** * Peace-Athabasca Delta Project Group, Sask, Alta * 1972 * 144p

The report provides a description of the setting of Lake Athabasca, the hydrology and ecology of the delta and a profile of the people who live in this region. The national and regional importance of the delta is illustrated. The low water levels since 1968 and their effects on the area are described, and long-term or future effects of these changes are outlined. Alternative solutions for the restoration of water levels are presented. Discussions of the legal framework, government coordination, and the Peace-Athabasca Delta project organization round out the report. Recommendations emanating from the study are provided.

Appendices and supplements / Appendices et suppléments

447 (018362)
PEACE-ATHABASCA DELTA PROJECT GROUP * ***The Peace-Athabasca Delta project, technical appendices, volume 1, hydrologic investigations*** * Peace-Athabasca Delta Project Group, Edmonton, Alta * 1973 * 618p

This volume of appendices related to hydrologic investigations begins with four sections (sections A to D) which describe the hydrologic and hydraulic conditions which exist in the delta. Section E examines the water levels in the delta which would result if no corrective measures are taken, and section F outlines various courses of action which have been considered for the control of water levels. The remaining sections cover a variety of subjects related to the hydrologic and engineering aspects of the project which ranged from investigations into the use of an ice dam, to navigation, to water quality, to geology and to ground water.

448 (018417)
PEACE-ATHABASCA DELTA PROJECT GROUP * ***The Peace-Athabasca Delta project, technical appendices, volume 2, ecological investigations*** * Peace-Athabasca Delta Project Group * 1973 * vp

The first four sections include species lists of plants, fishes, birds and mammals occurring on the delta. Sections E, F, and G describe the status of three fish species, the walleye, goldeye and lake trout, inhabiting the delta and Lake Athabasca. The next section contains information on plankton and bottom invertebrates of the delta lakes and marshes. Sections I and J describe the major wildlife habitats of the delta, how much is present and where, and how the vegetation changes over time due to plant succession. Next are four sections which discuss the status of waterfowl, muskrat, bison and moose on the Peace-Athabasca Delta. Finally, appendix O describes a wildlife computer model written to predict effects of water level changes on habitat and populations of the major wildlife species.

449 (012306)
PEACE-ATHABASCA DELTA PROJECT GROUP * ***The Peace-Athabasca Delta Project, technical appendices, volume 3, supporting studies*** * Peace-Athabasca Delta Project Group, Edmonton, Alta * 1973 * 482p

The first section of this appendix is a historical account of the major events which have contributed to the development of Fort Chipewyan and the surrounding delta region. The second study, a socioeconomic overview, discussed the demographic characteristics and economic activities of the region, focusing on Fort Chipewyan. The Peace-Athabasca legal framework study describes the relevant federal and provincial legislation in force just before construction of the Bennett Dam and assesses the effectiveness of this legislation as an acceptable framework for regulating major developments and resolving intergovernmental disputes arising from them. In section D, social and economic data from Indian settlements with a population and economic base similar to Fort Chipewyan were compared, in order to place the problems of the community in perspective. The final section is an assessment of current recreation and tourism activities in the Lake Athabasca region, particularly in the Saskatchewan portion. Several potential development opportunities are identified.

Miscellaneous reports / Rapports divers

450 (070014)
PEACE-ATHABASCA DELTA IMPLEMENTATION COMMITTEE * ***Peace-Athabasca Delta implementation committee status report for the period 1974-1983*** * Peace-Athabasca Delta Implementation Committee * Dec 1983 * ix, 44p

This report outlines the activities of the Peace-Athabasca Delta Implementation Committee from 1974 to 1983. The report is organized in six sections. Section I describes the Peace-Athabasca Delta and its importance. Section II outlines the history leading up to formation of the Implementation Committee and states the Committee's purpose. The next three sections present the activities of the Committee organized by topic and describe current conditions in the delta. The final section summarizes these activities along with their costs. The Peace-Athabasca Delta Implementation Agreement and the summary and recommendations from the Peace-Athabasca Delta Project Report are included as appendices.(au)

451 (069372)
Peace-Athabasca Delta project, the problems, proposals and action taken * Environment Canada * Dec 1971 * 24p

Low water levels occuring in the Peace-Athabasca Delta since 1968 are causing changes in the natural wildlife habitat resulting in ecological problems. An intergovernmental task force began work in January 1971 to make a detailed investigation of hydrological and ecological conditions in the delta. This brochure gives an outline of the nature of the conditions in the delta and the interim findings and recommendations of the task force. It also describes the course of action to be taken by Canada, Alberta and Saskatchewan to correct the problems. Brief descriptions are given of the specific studies undertaken to extend existing technical information and monitor certain aspects of the delta system. Socioeconomic characteristics, ecological considerations and the hydrological system of the Peace-Athabasca Delta are outlined; a capsule history of the area is provided.

8.2 Great Slave Lake Basin / Bassin versant du Grand lac des Esclaves

8.2.1 Hay River Basin / Bassin versant de la rivière Hay

Miscellaneous reports / Rapports divers

452 (070981)
GOVERNMENT OF THE NORTHWEST TERRITORIES, DEPARTMENT OF RENEWABLE RESOURCES, ENVIRONMENTAL PLANNING & ASSESSMENT DIVISION; GOVERNMENT OF CANADA, DEPARTMENT OF THE ENVIRONMENT, INLAND WATERS DIRECTORATE * ***Hay River Basin overview*** * Nov 1984 * 59p

The format of the Hay River Basin overview is designed to serve as a prototype for the overviews of the seven remaining basins with interjurisdictional concerns in the larger Mackenzie River system. Discussed in this overview are geographic aspects, which include location, size, geology and physiography, soils and vegetation, and climate; Hay River water quality, including physical parameters and water chemistry; major ions and nutrients; metals and organics; Hay River hydrology, including river patterns, annual runoff cycle, extreme flow events, data extension, monthly means, annual floods, and annual yield; and calculation of flow at jurisdictional boundaries. Hay River Basin resource use, both inside and outside the Northwest Territories, is discussed in such areas as forestry, agriculture, mining, dams and impoundments, transportation corridors, and oil and gas production. Two areas of future concern are highlighted: oil pipeline crossings on the Hay and Chinchaga rivers and saltwater spills or oil seepage.(au)

HUDSON BAY / BAIE D'HUDSON

9. SASKATCHEWAN-NELSON RIVER BASIN / BASSIN VERSANT DE LA RIVIÈRE SASKATCHEWAN ET DU FLEUVE NELSON

Final report / Rapport définitif

453 (063569)
PRAIRIE PROVINCES WATER BOARD * ***Water demand study, Historical and current water uses in the Saskatchewan-Nelson Basin, Main report*** * Prairie Provinces Water Board, Regina, Sask * 1982 * 147p

In 1976 the Prairie Provinces Water Board initiated a study of the historic and current water uses in the Saskatchewan-Nelson Basin. This Water Demand Study was completed in 1982 at a total cost of $945 000. It serves as a companion to an earlier study completed in 1972 entitled Water Supply for the Saskatchewan-Nelson Basin. The Water Demand Study deals with municipal, industrial, and agricultural water uses and with instream requirements for energy generation, recreation, and fish and wildlife habitat. Changes in water use between 1951 and 1978 and the factors affecting water use are documented. They indicate that water use is growing at a much faster rate than population. Agricultural water use is the largest net consumptive use of water in the basin. Some 1.47 million of the 1.69 million cubic decametres used consumptively in 1978 was used for agricultural purposes. The 1.47 million decametres is a 300% increase over the 370 000 cubic decametres used for the same purpose in 1951. Hydroelectric energy generation is the largest gross (non-consumptive) use, 410 million cubic decametres in 1978 with only 6 million cubic decametres being used for all other purposes. Between 1951 and 1978 hydroelectric uses increased from 136 to 410 million cubic decametres, an increase of 200%. This study led to several conclusions regarding the collection and analysis of water use data. The major conclusion relates to the importance of maintaining the data base that has been created. The continuing value of this data base for future studies will depend on the steps taken to keep it current and up to date.

454 (069343)
Water supply for the Saskatchewan-Nelson Basin * Saskatchewan-Nelson Basin Board * 1972? * 215p

A study of the engineering feasibility and cost of storage and diversion works needed to provide a firm water supply of varying amounts at various selected points along the Saskatchewan-Nelson Basin, was conducted. This report describes how the study was done and presents the results, findings and recommendations. Included in the results are reports on preliminary investigations of 55 possible reservoirs and 23 possible diversions; estimates of the natural supply of water at 145 points in the basin; a compilation of existing uses of water in the basin; and the determination of the possible supply of water throughout the basin for a number of hypothetical development possibilities. Summaries of prepared reports are on fish and the biological system, recreation, wildlife, river regime, water quality, ground water, and the effects of possible diversions on donor basins. The study's principal finding is that with major expenditures, large supplies of water could be made available throughout the basin, but the environmental consequences of storage regulation and diversion cannot be predicted with certainty at this time. A list of all the project investigation reports is in Table 29 of this report.

Summary report / Sommaire

455 (F14477)
CANADA ALBERTA SASKATCHEWAN MANITOBA * ***Approvisionnement en eau du bassin Saskatchewan-Nelson : rapport sommaire 1972*** * 1972 * 57p

Ce document porte sur une étude de l'approvisionnement en eau du bassin Saskatchewan-Nelson, et contient des recommandations à l'intention du Comité des ministres des trois provinces concernées (Alberta, Saskatchewan et Manitoba). L'étude montre qu'une approche coopérative entre les trois provinces est essentielle et donne de bons résultats. Ce rapport décrit la situation actuelle de l'approvisionnement en eau du bassin en donnant une liste des débits des rivières mesurés en 145 points. On y fait état des barrages et ouvrages de dérivation qui y ont déjà été construits, et on présente les résultats d'études préliminaires faites sur d'autres possibilités de stockage ou de dérivation d'eau pour accroître la quantité d'eau utilisable. Enfin, on énumère les possibilités d'accroître l'alimentation en eau dans le bassin hydrographique Saskatchewan-Nelson.

Appendices and supplements / Appendices et suppléments

456 (069344)
Appendix 1: Study background * Saskatchewan-Nelson Basin Board * 1972? * 188p

The historical and geographical background for the study of water supply is given. Explained in detail are the administration of the study and the complete text of a number of agreements which will affect future water planning in the basin. A description of the basin is given with the emphasis on water supply, and a history of events that lead up to the formation of the Saskatchewan-Nelson Basin Board with particular emphasis on water.(au)

457 (069345)
Appendix 2: project investigations * Saskatchewan-Nelson Basin Board * 1972? * vp

This appendix describes the design standards and cost guidelines that were developed for various aspects of the project investigations. Section A, Investigation Standards and Costs describes the standards used for project investigations carried out for the Board by contracting agencies and summarizes the costs of these investigations. Section B, Project Design Floods describes the procedures used in preparing design flood hydrographs for the project sites. Section C, Guidelines for Cost Estimating presents project costing guidelines developed by the Board and provided to cooperating agencies for their use in estimating costs of projects investigated. Section D, Cost of Pumping Power presents a study on the probable pumping power requirements and pumping costs of a number of possible diversion schemes which would involve pumping. Since this study covers such a large area, a common cost datum to compare projects and to evaluate alternative sizes and arrangements of the same project was instituted. Included in this section are the study method, necessary data, and study results.

458 (069346)
Appendix 3: project catalogue * Saskatchewan-Nelson Basin Board * 1972? * 200p

This appendix provides a convenient reference to the main features of storage and diversion possibilities in the Saskatchewan-Nelson Basin and the statistics describing existing projects. Possible diversion projects are limited by topographical factors. Each project description comprises two pages giving the location, principal features of the design, some text on the physical features, and the cost estimate. Three indexes provide listings of possible diversion schemes, possible storage projects and existing dam projects.

459 (074345)
Appendix 4: Hydrology, Volume 1, Section A - Streamflow, Section B - Evaporation, Section C - Streamflow Generation * Saskatchewan-Nelson Basin Board * 1972? * 284p

The Saskatchewan-Nelson Basin study included the assessment of the regulation capability of 55 possible reservoirs, 23 possible diversions, and existing reservoirs. This report describes how the basic streamflow and evaporation data were prepared prior to the commencement of the regulation studies.

460 (069347)
Appendix 4: Hydrology, Volume 2, flow tables * Saskatchewan-Nelson Basin Board * 1972? * vp

This volume contains the streamflow data assembled by the Saskatchewan-Nelson Basin Board and stored in its hydrometeorological data bank during the course of the study. Most of the tables contain monthly streamflow data, which may be either recorded flows at stream gauging stations or estimates of natural flows at gauging stations or project sites. Some supplementary tables which provide information and statistics related to the development of the streamflow data are included. A general description of the types of data presented and their arrangement in the volume, an explanation of the format of the tables, and a description of the indexes provided for obtaining access to any specific table, are included.

461 (073051)
Appendix 5: systems analysis * Saskatchewan-Nelson Basin Board * 1972 * 508p

This appendix describes the methods used to perform water supply studies in the Saskatchewan-Nelson Basin. The appendix is composed of three sections: data storage and retrieval, multi-reservoir analysis methods, and computer facilities and costs. Section A of the appendix describes the procedures established by the Saskatchewan-Nelson Basin Board staff to create, maintain and use data processing devices to store large amounts of data. Data banks were used to store streamflow data, meteorologic data, evaporation data, project data and analysis output data. Section B of the appendix describes the methods used to perform different analyses of multi-reservoir systems. The objectives of multi-reservoir analysis is to compute how new and existing reservoirs (and diversions) affect the flow of rivers in the basin. The simplest technique used was the mass curve, while the most complex was a simulation model that used network analysis on a month-by-month basis. Section C of the appendix deals with the computer facilities used throughout the course of the study and presents the costs of executing some of the programs. The cost data are intended to provide an approximation of the costs which will be incurred using Saskatchewan-Nelson Basin Board programs and data banks.(au)

462 (069348)
Appendix 6: Regulation studies * Saskatchewan-Nelson Basin Board * 1972? * 675p

As part of the Saskatchewan-Nelson Basin Study, regulated flows that could be supplied by many combinations of projects including dams and diversions were computed. This appendix describes how the regulated flows were computed and presents the results in graphical and tabular form. The regulation studies were done on a month-by-month basis to determine the uniform year-round flow that could be sustained by 244 different project combinations through a drought period lasting several years. The amount of water that would be withdrawn or used and the points in the basin at which the effects of regulation would be measured, are also described.

463 (071638)
Appendix 7: environmental considerations * Canada, Alberta, Saskatchewan, Manitoba * 1972 * 755p

The six studies in this report include fish and the biological system, recreation, wildlife, river regime, water quality, and ground water. The reports include recommendations made by the authors for more data and studies. Each report addresses the following questions for each topic: What is the present situation or what is known about the topic or resource within the basin? What kinds of things would happen as a result of the construction of reservoirs and diversions? What kinds of information and studies are needed so that the effects of future projects can be predicted with confidence?

464 (030276)
Appendix 8: effects of diversion on donor basins * Modern Press, Saskatoon, Sask * 1972 * 414p

Early in the course of the study, the Saskatchewan-Nelson Basin Board decided that some consideration should be given to subjects other than water supply even though no such provision has been made in its terms of reference. Arrangements were made for knowledgeable persons to report on each of eight topics: fish and the biological system, recreation, wildlife, river regime, water quality, ground water, the effects of diversion on the Churchill River system, and the effects of diversion on the Mackenzie River system. A complete study of each topic was not possible within the framework of the SNBB Study, so a general appraisal was made and reproduced in appendices 7 and 8. Appendix 8 contains the two reports on the possible effects of diversion on donor basins, one for the Mackenzie River system and one for the Churchill. Effects considered are morphology, water quality, navigation, wildlife and ecology, fisheries, and hydroelectric power.

465 (063570)
PRAIRIE PROVINCES WATER BOARD * ***Water demand study, Historical and current water uses in the Saskatchewan-Nelson Basin, Appendix 1,***

Regional economic base * Prairie Provinces Water Board * 1982 * 517p

This study, prepared as a component of the Prairie Provinces Water Board's study of current and historical water use in the Saskatchewan-Nelson River Basin, determines the nature of the current (1976) economic base of the basin and traces its historical development from 1950, provides data and analysis regarding this economic base suitable for use in other studies as well as the overall project and, in possible forecasting of water demands that may be undertaken, formulates a system of sub-regions for storing, manipulating and analyzing the data, and provides disaggregated data for a centralized data storage and retrieval system. The report includes four major statistical subsets: population, agriculture, mineral extraction, and manufacturing. The population subset is composed of urban/rural, age/sex and income breakdowns. Analysis consists of a computation of growth rates and a discussion of population and farm population comprise the agricultural sector. The industrial sector consists of data on employment, wages and salaries, value of shipments and value added. Major subsets are then brought together in presenting profiles of each sub-basin.

466 (069368)
PRAIRIE PROVINCES WATER BOARD * ***Water demand study, historical and current water uses in the Saskatchewan-Nelson Basin, Appendix 2, Volume 2 of 2 Municipal and industrial water uses*** * Prairie Provinces Water Board * 1982 * vp

This study provides an overview of the municipal and industrial water uses within the Saskatchewan sector of the Saskatchewan-Nelson Basin. The information and analyses presented were derived from a variety of primary and secondary sources, which included interviews with municipal and provincial officials as well as a detailed search of records and files. This report is organized according to the eight major Saskatchewan sub-basins of the Saskatchewan-Nelson drainage system. The water use in each area is analyzed with respect to the use by all non-farm residents and by the industrial establishments, with particular emphasis placed upon the water withdrawals by the large communities and the major industrial water-using establishments. The analysis primarily involved a comparison of historical and current water use trends and attempted to relate these to a limited number of socioeconomic variables. This was performed with the goal of identifying the factors affecting water use. It must be recognized that this study was limited by data availability. Future research and funding should be directed towards a more quantitative analysis of the factors identified and to the establishment of an ongoing data reporting and storage system.(au)

467 (063530)
PRAIRIE PROVINCES WATER BOARD, COMMITTEE ON WATER DEMAND, MUNICIPAL INDUSTRIAL SUBCOMMITTEE * ***Water demand study, Historical and current water uses in the Saskatchewan-Nelson Basin, Appendix 2, Volume 1 of 2, Municipal and industrial water uses*** * Prairie Provinces Water Board * Dec 1982 * vp

This report deals with the municipal and industrial water uses in the 15 sub-basins of the Saskatchewan-Nelson Basin. The emphasis is on water withdrawals for use by large communities and major water-using industries, although water usage by small communities, unincorporated settlements and minor industrial water users are also examined. Socioeconomic data generated by the Regional Economic Base Study (Appendix 1) were related to water use trends to establish relationships and explain the differences that exist among individual municipal and industrial users. Data collection and analysis covers the years 1951, 1956, 1961, 1971, 1976, 1977 and 1978. Various factors affecting water use within the provincial sectors of the basin are outlined. Municipal and industrial water use in the basin is summarized and the conclusions of the study regarding both water use patterns and the major factors affecting water use, are presented. Data requirements for future studies, data inadequacies and recommendations relative to data storage and retrieval are discussed. Annexes to the report include the Memorandum of Understanding for the Municipal and Industrial Sector Report, a Glossary and the Alberta Agency Report, summarizing municipal and industrial use in Alberta. It also contains monthly and annual pumpage values for large and small communities, details of individual sewage systems, net evaporation values and an individual listing of major industrial water users and their annual consumption by sub-basin.

468 (063571)
PRAIRIE PROVINCES WATER BOARD * ***Water demand study, Historical and current water uses in the Saskatchewan-Nelson Basin, Appendix 3, Agricultural water uses*** * Prairie Provinces Water Board * 1982 * vp

This agriculture study, prepared as a component of the Prairie Provinces Water Board's Study of historical and current water use in the Saskatchewan-Nelson Basin, compiles current and historical statistics on water use in the agriculture sector for the period 1951-1976 and 1977 and 1978 where possible, organizes these data into an analytical framework that can be updated as required, and analyzes the factors, both physical and economic, that influence the amount of water used in the agriculture sector. The agriculture sector studies are related to three primary water uses: domestic use by the farm population; stockwatering; and irrigation, including both private and district operations. Agricultural water used in the sub-basins (North Saskatchewan River, Red Deer River, Bow River, Oldman River, South Saskatchewan River, Saskatchewan River, Qu'Appelle River, Old Wives Lake, Assiniboine River, Souris River, Pembina River, Red River, Winnipeg River, Lakes, and Nelson River) is described. Factors affecting irrigation development are presented and discussed. Conclusions reached regarding the need

for maintaining or improving the data base are formulated in nine specific recommendations.

469 (063568)
PRAIRIE PROVINCES WATER BOARD * ***Water demand study, Historical and current water uses in the Saskatchewan-Nelson Basin, Appendix 4, Power generation water uses*** * Prairie Provinces Water Board * 1982 * vp

This study, prepared as a component of the Prairie Provinces Water Board's Study of historical and current water use in the Saskatchewan-Nelson Basin, is concerned with historical and current water use for hydroelectric and thermal electric energy generation. The study includes collection and analysis of water use and energy production data for both hydro and thermal plants for those sub-basins where energy was produced during the period 1951 to present; determination of relationships between energy consumption and other variables such as population and industrial activity in the basin, as well as the relationship of water use as a function of variables including plant capacity, load factor, thermal efficiency and energy production; discussions of the basin power grid, provincial inter-ties and their evolution, and the cost-effectiveness of alternative methods of energy production including nuclear power; and discussion of energy exported from and imported into the study area.

470 (063531)
PRAIRIE PROVINCES WATER BOARD, COMMITTEE ON WATER DEMAND, RECREATION SUBCOMMITTEE * ***Water demand study, Historical and current water uses in the Saskatchewan-Nelson Basin, Appendix 5, Recreational water uses*** * Prairie Provinces Water Board * Aug 1982 * vp

This study identifies and catalogues all known water-based recreation sites within the Saskatchewan-Nelson Basin. Water quantity and quality problems known to inhibit activities at specific sites are documented to provide an additional dimension to recreation and water supply. The methodology is presented and a basin overview is provided for water-based recreation. The information is organized by sub-basin according to each of the provincial portions of the basin. Topics covered are supply, participation, and water requirements. User aspects of water-based recreation are examined as well as the underlying factors affecting the demand for recreation. The distribution of sites is discussed by activity, sub-basin, and participation rates, and trends in participation are given by activity and province. Demographic data and participation rates are analyzed. The primary sources of information for this report are detailed reports by Alberta Environment, Saskatchewan Environment, and the Manitoba Department of Natural Resources, which are included as annexes to the report.

471 (063532)
PRAIRIE PROVINCES WATER BOARD, COMMITTEE ON WATER DEMAND, ENVIRONMENTAL CONSIDERATIONS SUBCOMMITTEE * ***Water demand study, Historical and current water uses in the Saskatchewan-Nelson Basin, Appendix 6, Environmental considerations*** * Prairie Provinces Water Board * Oct 1982 * vp

This report focuses on the river flow aspects of the environmental considerations for the Saskatchewan-Nelson Basin. A brief overview of the river environment is provided, with emphasis on the effects of regulation on streamflow and the significance of streamflow to wildlife habitat. The data used in this study describes three areas of interrelated concerns: 1) historic and current hydrology and geomorphology relevant to fish and wildlife habitats and to some instream use; 2) fish and wildlife habitats related to major rivers, creeks, and lakes, and to their immediate surroundings; and 3) water quality of selected rivers and lakes as it is relevant to fish and wildlife habitats and to some instream uses. A description is given of each of eight major river systems in the basin, and a summary is given of the degree to which the objectives of the environmental considerations sector study were met. The source documents for this report, prepared by the provincial agencies, are attached as annexes. They provide detailed descriptions of the river corridors, including geomorphic and hydrologic characteristics of the major tributaries, fish habitat, wildlife habitat, other instream uses of water (transportation), and water quality. The relationship between existing conditions and river discharge is also discussed in that man-made alterations to the river regimes and the subsequent impacts on habitat are identified.

Miscellaneous reports / Rapports divers

472 (069349)
SASKATCHEWAN-NELSON BASIN BOARD; DEPARTMENT OF ENERGY, MINES & RESOURCES, INLAND WATERS BRANCH * ***Annual report for the year ending March 31, 1970*** * Saskatchewan-Nelson Basin Board * May 1970 * 20p

A summary of activities is presented, describing the activities of the Board, the Engineering Advisory Group, and the study staff during the fiscal year. A list is given of the technical reports completed and in progress. The background, organization and administration of the program are detailed, and the appendices provide an outline of program projects, a statement of expenditures, and the terms of reference. Maps illustrate the various stages in the program plan for the storage and diversion of water and selected study points.

9.1 Assiniboine-Red River Basin / Bassin versant des rivières Rouge et Assiniboine

9.1.1 Assiniboine River Basin / Bassin versant de la rivière Assiniboine

9.1.1.1 Qu'Appelle River Basin / Bassin versant de la rivière Qu'Appelle

Final report / Rapport définitif

473 (032316)
QU'APPELLE BASIN STUDY BOARD * ***Report of the Qu'Appelle Basin Study Board*** * Environment Canada, Saskatchewan Environment, Manitoba Department of Mines, Resources, Environment * 1972 * 65p

This document presents a comprehensive framework plan to develop and manage the water and related land resources of the Qu'Appelle Basin for social betterment and economic growth. The report presents data on current physical, demographic and economic conditions in the basin; an estimation of future demands for water and land and identification of problems; and an analysis and evaluation of alternative means of water and related land management for achieving the planning objectives. The recommendations are presented in five categories: water quality, water supply, land and water surface use, adjustment to the flood hazard, and general.

Miscellaneous reports / Rapports divers

474 (069360)
Qu'Appelle Basin study report on public hearings of February, 1971 * Qu'Appelle Basin Study Board, Regina, Sask * Mar 1971 * 61p

Approximately 80 briefs were heard by the Qu'Appelle Basin Study Board at five centres (Melville, Broadview, Regina, Moose Jaw and Fort Qu'Appelle) in the Qu'Appelle Basin, Saskatchewan, on problems in the basin concerning present and future water requirements, water quality, pollution, flooding, lake levels and development. These hearings were intended to help in the development of an adequate plan for the management of water and related land in the Qu'Appelle Basin. In general, most briefs concentrated on immediate problems and conditions in the short term, rather than on longer term considerations for the basin. Included in this report are a review of briefs presented at each centre, and commentary, analysis, limitations and review of the public hearings.

475 (040215)
Qu'Appelle River system and operation, technical document * Canada, Saskatchewan, Qu'Appelle Valley Management Board, Regina, Sask * 1977 * 29p

Droughts, as well as floods and fluctuating lake levels, directly affect everyone in the Qu'Appelle Basin in one way or another, and are therefore matters of public concern. This publication has been prepared to help answer some of the questions which may arise concerning the operation and management of the Qu'Appelle River system. A location map and glossary of technical terms are included.

9.1.1.1.1 Wascana Creek Basin / Bassin versant du ruisseau Wascana

Final report / Rapport définitif

476 (069361)
Wascana Creek flood study * Qu'Appelle Basin Study Board, Regina, Sask * 1974 * 73p

This study was carried out under the Qu'Appelle Basin Study to address the flood problems of Wascana Creek at the city of Regina and surrounding area. The study program involved describing the flood problem, defining specific objectives, identifying and evaluating a range of flood adjustment alternatives, and selecting a management plan for the flood plain. The details of the study are contained in five appendices. Fourteen structural and non-structural recommendations are made, forming the flood plain management plan.

Appendices and supplements / Appendices et suppléments

477 (070027)
HARPER, I.P. * ***Wascana Creek flood study, Appendix 1, existing and proposed land use and regulation*** * Qu'Appelle Basin Study Board * 1973 * iii, 69p

This report examines possible adjustments relating to changes in land use and zoning that were contemplated for the Wascana Creek flood plain in the vicinity of Regina. Sections of the report analyze current development in terms of existing land uses and land ownership, review existing regulations and relevant

legislation as they relate to the study area, and outline a series of alternative proposals and recommendations regarding land use regulation. The proposals outline in general terms approaches to flood plain planning which utilize land use changes and regulatory requirements.(au)

478 (070028)
FORSYTH, G.T. * ***Wascana Creek flood study within the city of Regina, Appendix II, engineering and hydrologic investigations*** * Canada Department of Regional Economic Expansion, Prairie Farm Rehabilitation Administration, Engineering Service * May 1973 * 68p

This report presents the results of engineering and hydrologic investigations in support of flood control studies of Wascana Creek at Regina. The hydrology of the Wascana Creek Basin above Regina and the hydraulics of the creek from Richardson to the Regina sewage lagoons were studied as a basis for proposing flood control measures to protect the city from floods up to a frequency of 0.2%. Preliminary engineering design and cost estimates are presented for three flood control alternatives.(au)

479 (070018)
KELLOW, R.L. * ***Wascana Creek flood study, Appendix III, potential flood damages*** * Qu'Appelle Basin Study Board * 1973 * ii, 45p

This report estimates the potential flood damages for frequencies of 1:50, 1:100, and 1:500, and the average annual flood damage for the Wascana Creek flood plain in the Regina area. This report provides some of the basic information received to evaluate various flood adjustment alternatives for Regina. Synthetic flood damage - depth curves, which were developed by Acres Ltd., were used in the analysis. Potential direct and indirect damage estimates were made for residential and non-residential uses.(au)

480 (070016)
PENTLAND, R.S. * ***Wascana Creek flood study, Appendix IV, contingency measures*** * Qu'Appelle Basin Study Board * Jan 1974 * 37p

This report examines the feasibility of integrating non-structural contingency measures with other measures which are to form the basis for a flood management plan for the flood plain of Wascana Creek at Regina. These measures are flood forecasting, flood warning and emergency action. The report concludes that contingency measures alone would not reduce structural flood damages in floods greater than the 1:50 level, with the exception of contents damages to homes.(au)

481 (070017)
SASKATCHEWAN DEPARTMENT OF THE ENVIRONMENT * ***Wascana Creek flood study, Appendix V, evaluation of flood adjustment alternatives*** * Qu'Appelle Basin Study Board * 1973 * vii, 87p

This report brings together data that were compiled in other fact-finding studies about the Wascana Creek flood problem in Regina. These studies detailed the flood damage potential, current and proposed land use for the area, the hydrologic characteristics of the flood plain, and the design and costs of a range of flood adjustment alternatives. This report consists of the assembly of this basic information and the evaluation of the flood adjustments to meet the overall objectives of the study. This report found that the Wascana Creek flood plain could effectively be managed through implementation of a program consisting of zoning, land use regulations, improvements to the diking system, flood proofing, and development of a flood forecasting, warning, and emergency measures service.(au)

9.1.1.1.2 Moose Jaw River Basin / Bassin versant de la rivière Moose Jaw

Final report / Rapport définitif

482 (059493)
QU'APPELLE BASIN STUDY BOARD * ***Moose Jaw River Study*** * Feb 1974 * 90p

This report describes a study of the Moose Jaw River, through the city of Moose Jaw, which was undertaken in order to develop a plan to reduce water pollution, maintain stable water level and provide flood control and flood plain management for the city. Studies that were conducted to provide the information necessary to develop and evaluate alternative courses of action, are described briefly. More detailed information concerning the scope, the methodologies and the results of the various studies undertaken is found in the appendices to the report. The major part of this report is directed primarily at examining management alternatives identified. Specific problems and planning objectives are discussed and various management alternatives relating to flood plains, water quantity and water quality are presented and evaluated. Planning alternatives are discussed and assessed and the findings and conclusions of the study are reviewed.

Appendices and supplements / Appendices et suppléments

483 (039667)
Moose Jaw River study, appendix 1, hydrology * Qu'Appelle Basin Study Board Canada-Saskatchewan-Manitoba * Aug 1973 * 71p

This report summarizes the hydrologic investigations undertaken in 1972 and 1973 to help develop a

management plan for the control of pollution, maintenance of stable water levels and flood plain management for the Moose Jaw River at the city of Moose Jaw. The report discusses the development of flood hydrographs; the routing of the flood hydrographs through the upper and lower site reservoirs; the preparation of water level profiles through the city of Moose Jaw; and the determination of the water supply potential of the upper and lower dam site reservoirs and the summer water supply dam. The stage I (1966) and stage II (1967) investigations of the Moose Jaw Creek Basin studies together with the Qu'Appelle flood study (1972) provided much of the basic data and analysis methods used in this study.

484 (039666)

Moose Jaw River study, appendix 2, engineering study and structural alternatives * Qu'Appelle Basin Study Board Canada-Saskatchewan-Manitoba * 1974 * 125p

Engineering investigations were undertaken as part of the study program for two purposes. The first was to provide basic data for other parts of the study program, principally the hydrology studies. The second was to derive capital, and in some cases, annual costs for engineering works considered as alternative solutions to the problems defined by the study. To satisfy these two requirements, both a field and office program were necessary. The field program was undertaken starting in October 1972, and was completed in January 1973, with the exception of several one-day field trips of a follow-up nature. It consisted primarily of a resurvey of cross-sections of the river channel originally taken in 1966, a horizontal and vertical control survey for aerial mapping of the flood plain, a topographic survey of the reservoir areas within the city, and elevations of all buildings in the flood plain. Field reconnaissances were made of possible dyke locations through the city and of crossing locations on the two upstream reservoirs discussed in the study. Several field inspections of individual structures and/or sites were also made.

485 (039665)

Moose Jaw River study, appendix 3, flood plain occupancy and flood damages * Qu'Appelle Basin Study Board Canada-Saskatchewan-Manitoba * Aug 1973 * 37p

This report contains information concerning the occupancy of the Moose Jaw River flood plain and the costs of projected flood damages for floods of various frequencies on the river within the city limits. A detailed questionnaire was distributed to people living in the flood plain who occupy properties prone to flooding. Excellent returns of 113 questionnaires out of a possible 119 (95%) provided a valuable insight into the social and economic conditions arising out of flood disruption. The results of the questionnaire also provided a check on the estimated residential damages for the 1:50 flood. Projected structural and content damages for various floods of different frequencies were calculated by the use of the methodology derived by Acres Limited. A detailed survey of all buildings in the flood plain was completed. The elevation of the lowest entry point at which flood water would invade basements and the elevation of the first or main floor was obtained by engineering level surveys. Each residence was classified as to type according to Acre's classifications, and damages to industrial and commercial outlets were inventoried. Acre's flood damage curves for homes provided the means for the calculation of estimated residential damages. Potential flood damages were then used to develop probability damage curves from which the average annual damage estimates could be derived.

486 (039664)

Moose Jaw River study, appendix 4, non-structural alternatives for flood plain management * Qu'Appelle Basin Study Board Canada-Saskatchewan-Manitoba * Aug 1973 * 28p

The purpose of this report is to present information relating to measures directed at reducing the potential for flood damage and measures directed at modifying the damaging effects of floods as they apply in Moose Jaw. A first program included flood forecasting, a flood warning system, and emergency action procedures. A second program, flood proofing, included both permanent, long-term measures and temporary measures which could be implemented in an emergency.

487 (039663)

Moose Jaw River study, appendix 5, water quality study * Qu'Appelle Basin Study Board Canada-Saskatchewan-Manitoba * 1974 * 64p

The water quality portion of the Moose Jaw River Study was carried out under a federal-provincial agreement during the period August 1972 to January 1973 for the purpose of determining the present water quality of the Moose Jaw River Basin, the point source causing deterioration of the quality of this river system, and the effects of flow augmentation on water quality as related to recreational and aesthetic qualities within the limits of the city of Moose Jaw. The natural nutrient concentrations in the headwaters of this river system are present at levels generally considered to be sufficient to cause algae and week growth problems in impoundments, in backwaters, and along shorelines of the Moose Jaw River. The elimination of the Canadian Forces Base effluent input to the waters of this river above the city of Moose Jaw will reduce the nutrient levels. The removal of nutrients from the city of Moose Jaw's effluent outfall to the Moose Jaw River is mandatory for a quality improvement in the waters in the downstream reaches of this river. During the fall period of August to October when very little natural flow occurs in the Moose Jaw River, the nutrient input to the Moose Jaw River is approximately 20% from the Canadian Forces Base, 80% from the city of Moose Jaw lagoon and less than 1% from runoff. On an annual basis, however, estimates indicate that runoff from above the city accounts for 67%, the Canadian

Forces Base for 1%, Thunder Creek for 5%, the Moose Jaw lagoon for 21% and other direct runoff for 6% of the nitrogen and phosphorus input to the system. Minor elements and Thunder Creek account for 5%, the Moose Jaw lagoon for 21% and the Canadian Pacific Railway Dam in significant quantities. Data also indicates that oil and the nutrients nitrogen and phosphorus are present in the sediments at six locations.

488 (039662)
WILSON, C.D. * ***Moose Jaw River study, appendix 6, sedimentation study*** * Qu'Appelle Basin Study Board Canada-Saskatchewan-Manitoba * 1974 * 24p

Based upon limited field data, the objective of this study was to 1) arrive at an estimate of sediment yield for flood frequencies of 1:2, 1:10, 1:25 and 1:50 at the following hydrometric gauging stations: (a) Moose Jaw River above Thunder Creek; (b) Moose Jaw River near Burdick; and 2) to estimate the trap efficiencies of the reservoir created by the Canadian Pacific Railway Dam in the city of Moose Jaw and the proposed upper site and lower site reservoirs located on the main stem Moose Jaw River above the city of Moose Jaw. Because of the limited sediment data available, the assumption that bed load is small compared to total load and the uncertainty of the slope and/or position of the discharge versus sediment discharge curves for hydrometric gauging stations, Moose Jaw River above Thunder Creek and Moose Jaw River near Burdick, all values arrived at in this report should be classified as rough estimates. The increase in capacity of 3.6 acre-feet between 1966 and 1972 of the reservoir created by the CPR Dam may not be accurate due to the assumptions made and the method used in determining volume change. If one accepts this value, it would suggest that little siltation or scour occurs in the reach considered, and that the channel is relatively stable considering man-made changes that have occurred.

9.1.1.2 Souris River Basin / Bassin versant de la rivière Souris

Final report / Rapport définitif

489 (034125)
Souris River Basin Study report * Souris River Basin Study Board, Regina, Sask * June 1978 * 187p

The goal of the Souris River Basin Study was to formulate a plan which will serve as a guide to management and development of the water and related resources of the Souris River Basin in Canada. Water management and development possibilities were assessed insofar as they satisfy existing water needs, solve existing problems, and meet foreseeable and long-term future water requirements. Many of the problems and water needs were identified by citizens of the basin through a public involvement program. In the formulation of the plan, due consideration was given to public response to the various water projects considered and to environmental consequences. The report summarizes the findings of the study and presents conclusions and recommendations for future management of the water and related resources. The report consists of eight chapters: provides terms of reference for the study and other pertinent background material; describes the characteristics of the basin including the social and economic setting, and the legal, administrative and institutional arrangements; presents the availability of water and related resources for management and development; describes the magnitude of the existing problems in the basin; identifies future levels of development and the associated water requirements; contains a description and results of detailed evaluations of each of the water management and development possibilities; discusses the results of the detailed evaluations and presents conclusions; and contains the Board's recommendations. The report has nine detailed supplements with the following titles: public involvement; flood damage reduction; water supply; water quality; water related resources; agriculture; economic studies; detailed evaluations; and legal, institutional and administrative arrangements.

Summary report / Sommaire

490 (073069)
Souris River Basin study : summary and recommendations * Souris River Basin Study Board * 1978

This pamphlet provides a summary of the Souris River Basin Study and its major recommendations. Included in this summary is a description of the study, its organization, objectives and the water problems that were identified. A large portion of the folder is reserved for a review and explanation of the flood damage reduction measures that were developed as a result of the study.

Appendices and supplements / Appendices et suppléments

491 (034226)
GTS MILLS AND ASSOCIATES * ***Souris River Basin Study, supplement 1, public involvement*** * Souris River Basin Study Board, Regina, Sask * June 1978 * 200p

The Public Involvement Program conducted as part of the Souris River Basin Study was organized in such a way that the information, insights, and perceptions of the people who live beside the river would form

part of the study. The program also shared with the people all of the information gathered during the study. The following report and appendices described how that occurred and what the results were.

492 (070020)
Souris River Basin study, supplement 2, flood damage reduction * Souris River Basin Study Board * June 1978 * 2v

Volume 1 contains reports with extensive tables and graphs on flood hydrology, including frequency curves, flood hydrographs for main stem stations, a computerized flood routing model and flood lines; an assessment of the existing flood damage potential along the Saskatchewan portion of the Souris River; the hydrologic effect of drainage development on flood flows at points of entry to the Souris River; a preliminary evaluation of flood damage reduction options in the Saskatchewan portion of the Souris River Basin; a review of the flooding problems in the basin upstream of Weyburn; and an urban flood damage reduction program for urban areas along the Souris River in Saskatchewan. Volume 2 contains reports relating to the Manitoba portion of the Souris River Basin: an assessment of flood damages; the effect of existing and proposed drainage works; preliminary evaluation of flood damage reduction options; a detailed evaluation of selected flood damage reduction options; and selected urban and agricultural flood damage reduction programs.

493 (070023)
Souris River Basin study, supplement 3, water supply * Souris River Basin Study Board * June 1978 * 2v

Volume 1 describes in detail the procedures used to determine the monthly natural flows for the Souris River Basin and includes tabulated arrays of recorded streamflows, adjustments and natural flows. It includes a surface water supply report describing the accumulation of historical water use, the calibration of the water supply model, and the development of present use flow arrays. Volume 2 contains a detailed description of the major aquifers of the Souris River Basin in Saskatchewan (the Estevan Valley Aquifer, the Weyburn Valley Aquifer and the Ravensberg Bedrock Aquifer), estimates the sustained and mining yield of each aquifer and assesses the groundwater quality. It also contains an assessment of groundwater potential in the Manitoba portion of the basin, present consumptive use of ground water and its relationship to surface supplies; an analysis of present water use in the Saskatchewan and Manitoba portions of the basin and estimates of future water demand; a preliminary evaluation of water supply projects in both the Saskatchewan and Manitoba portions of the basin; and a detailed discussion of selected water supply runs, including background for the selected water supply combinations, a discussion of input data required to simulate these combinations and a tabulation of the adequacy of each combination.

494 (070021)
Souris River Basin study, supplement 4, water quality * Souris River Basin Study Board * June 1978 * vp

This volume contains the following reports with extensive tables and graphs: water quality of the Souris River Basin; biological analyses, 1975 and 1976; an assessment of the Souris River Study water quality model; Saskatchewan municipal wastewater treatment study - Souris River Basin; waste treatment study - Manitoba; report on the effect on water quality of proposed water supply plans for the Souris River Basin; and activities in North Dakota affecting water quality in the Souris Basin.

495 (070022)
Souris River Basin study, supplement 5, water-related resources * Souris River Basin Study Board * June 1978 * 2v

Volume 1 contains reports relating to the Saskatchewan portion of the Souris River Basin: a preliminary identification of conservation and enhancement projects having wildlife, fisheries and recreational benefits; baseline data on wildlife, wildlife habitats, fisheries, fish habitats, recreation and historic resources; a study of the present use of related resources; an estimation of future use of fish, wildlife and water-based recreation resources; and the relative potential impact of water supply and flood damage reduction options on wildlife, fisheries and recreation. Volume 2 contains reports relating to the Manitoba portion of the basin: management options for wildlife enhancement; baseline data on wildlife populations, fisheries and recreation; management options for the Souris River sport fishery; the present and future use of the wildlife and sportfish resources; an evaluation of the archaeological knowledge of southwestern Manitoba and of the possible impacts of development of the Souris River Basin; the assessment of recreational needs and the benefits of development of proposed reservoir sites; and the recreational impact of five proposed reservoirs.

496 (070019)
Souris River Basin study, supplement 6, agriculture and supplement 7, economic studies * Souris River Basin Study Board * June 1978 * vp

A study of the agricultural base on the Souris River in Manitoba discusses current land use in relation to the Canada Land Inventory soil classes and presents statistics on crop selection. Soils are rated for irrigation suitability and order of preference in development for irrigation. The influence of irrigation and other farming practices on water requirements is briefly discussed, and details are given of the soil characteristics along two routes selected for canals through the Weyburn-Virden area. An economic study of the Souris River Basin describes population, employment, industrial and agricultural characteristics on a province-by-province basis and identifies a range of possible future developments in the basin based on available water and other factors.

497 (034277)
Souris River Basin Study, supplement 8, detailed evaluations * Souris River Basin Study Board, Regina, Sask * June 1978 * 132p

This report contains the results of a study by the Souris Evaluation Team involving the development of a study methodology, the detailed evaluation of options and plans, and the consolidation of the data and findings into an evaluation supplement. The general study methodology was developed to consist of recognizing objectives, problems identification, formulation of alternative solutions and a detailed evaluation procedure. The results of the evaluation process after its application to water supply, flood damage reduction and related resource problems in the basin are presented. Issues such as induced economic activity and an estimation of irrigation benefits are included.

498 (034278)
MCKERNESS, L. * ***Souris River Basin Study, supplement 9, legal, institutional and administrative arrangements*** * Souris River Basin Study Board, Regina, Sask * June 1978 * 169p

This report provides descriptive background regarding opportunities for practical means of cooperative action in the field of water resource management. The ways in which the legislative and administrative framework affects the management of water-related resources in the Souris River Basin are presented. International (USA) obligation, interprovincial (Prairie provinces) constraints, and provincial (Saskatchewan and Manitoba) legislation regarding water resources are considered. The Souris River Basin is one example of cooperative action in the field of water resources between the provinces and the federal government.

Miscellaneous reports / Rapports divers

499 (069371)
Souris River Basin, Canada - Manitoba - Saskatchewan : working group report * June 1972 * 57p

This report outlines a proposed comprehensive study of the Souris River Basin in Canada. Problems such as poor water quality, damaging flood and periodic water shortages, all complicated by the international character of the basin, are said to contribute to the need for such a study. Also to be considered are the potential development opportunities with respect to recreation, fish and wildlife. It is recommended that the study be undertaken jointly by the governments of Canada, Saskatchewan and Manitoba. The study, which would culminate in the formation of a framework plan for the management of water and related resources of the basin, would be conducted over a 3-year period beginning January 1, 1973. The total cost of the study would be shared on the basis of Canada, 60%, Saskatchewan, 23%, and Manitoba, 17%. The study would be undertaken in three related phases, and a study group consisting of a study director and small supporting staff would coordinate and oversee the study activities. Technical guidance to the study director would be provided by a Souris Technical Advisory Group. A description of the Souris River Basin is given. The appendices contain the terms of reference and describes the manner in which the working group performed its task; an inventory of available reference information; a detailed itemization of the study program; and the draft agreement establishing the study.

9.2 Lower Saskatchewan-Nelson River Basin / Bassin versant du cours inférieur de la rivière Saskatchewan et du fleuve Nelson

9.2.1 Manitoba lakes Basin / Bassin versant des lacs du Manitoba

9.2.1.1 Lake Winnipeg / Lac Winnipeg

Final report / Rapport définitif

500 (022317)
Technical report * Lake Winnipeg, Churchill and Nelson Rivers Study Board, Winnipeg, Man * 1975 * 458p

Over the past decade, use of the waters of that portion of the Churchill River and Nelson River drainage basins located in Manitoba has been accelerating. The main use to date has been in the development of hydroelectric power by the provincially owned public utility, Manitoba Hydro, under authorization by the provincial government. Electrical energy demand is expected to double during the next decade. There is also an ever-increasing awareness of the need to preserve Manitoba's natural environment and to allocate natural resources with a view to benefiting Manitobans now and in the future. Following the decision by the government of Manitoba to authorize the Nelson River Hydroelectric Development Program, attention focused upon the major changes that could be expected to affect all direct and indirect users of these waters. Consequently, in August 1971, the federal and provincial governments entered into an agreement to undertake a comprehensive study of the effects of the regulation of Lake Winnipeg, diversion from the Churchill River and development of the hydroelectric potential of the

diversion route. This report presents the findings, conclusions and recommendations of the study. The decisions to undertake the development and to proceed with the regulation of Lake Winnipeg and the diversion from the Churchill River were made prior to the initiation of this study. The study was limited to examination of conditions that existed prior to the commencement of the development program, to prediction of effects of this program, and to recommendation of measures that might be undertaken to enhance the overall benefits and to mitigate undesirable effects of the hydroelectric development. A board, composed of six members representing the federal and provincial governments, was responsible for conducting the study. The Board exercised this function by appointing a study director to administer the study program and by appointing a technical advisory committee of two members representing each government to assist the director. All working documents, on which the report is based, are reproduced as appendices. While this report deals specifically with the task assigned to the study board under the terms of the intergovernmental agreement, it can serve as a reference for future northern development programs and monitoring studies.

Summary report / Sommaire

501 (F14476)
COMMISSION D'ÉTUDE DU LAC WINNIPEG, DE LA RIVIÈRE CHURCHILL ET DU FLEUVE NELSON * ***Commission d'étude du lac Winnipeg, de la rivière Churchill et du fleuve Nelson, Canada, Manitoba, avril 1975 : rapport sommaire*** * 1975 * 64p

En 1966, le gouvernement du Manitoba a décidé d'accroitre l'énergie potentielle du fleuve Nelson en y détournant un important débit de la rivière Churchill et en régularisant le débit du lac Winnipeg. Dans ce but, une étude a été entreprise pour déterminer les effets de ces projets de dérivation et de régularisation sur les autres usages de l'eau et des ressources connexes. Ce rapport résume les aspects importants de l'étude, y compris les conditions sociales, économiques et écologiques des régions touchées par les projets de dérivation et de régularisation. On y étudie également les conséquences sur la population et l'environnement. Chacun des aspects est considéré pour les six secteurs géographiques touchés par le projet. Enfin, la Commission d'étude émet des recommandations concernant ce projet.

502 (069363)
Summary report * Lake Winnipeg, Churchill and Nelson Rivers Study Board * Apr 1975 * 64p

The Lake Winnipeg, Churchill and Nelson rivers Study was initiated by the governments of Canada and Manitoba under a joint agreement entered into on August 24, 1971. The agreement stipulated that the study of the probable effects of Manitoba Hydro projects affecting Lake Winnipeg, Churchill and Nelson rivers systems, include all important effects on the water regime and on related resource uses. The program consisted of studies to determine the effects on the water regime; the effects on the uses of water and related resources; and the social implications. The majority of the studies were initiated in the spring of 1972 and completed in the ensuing two years. The study was multidisciplinary, including such aspects as water regime, landscape, fishery, wildlife, navigation, mining, recreation, archaeology and communities. A listing of the component studies by area of investigation, study period, contract agency and approximate cost is provided. The area of study was subdivided into six geographic regions. These regions were designated as Lake Winnipeg, Outlet lakes, Southern Indian Lake, Diversion Route, lower Churchill River and lower Nelson River. The salient aspects of the study, including the social, economic and environmental conditions in regions affected by the regulation and diversion projects, are summarized in this report along with the anticipated implications to the people and the environment. Opportunities for increasing overall benefits and lessening harmful effects are also outlined.(au)

Appendices and supplements / Appendices et suppléments

503 (069350)
Appendix 1, background documents and interim reports * Lake Winnipeg, Churchill and Nelson Rivers Study Board * nd * vp

This report contains a collection of documents and reports. The terms of the Canada-Manitoba Study Agreement on Lake Winnipeg, Churchill and Nelson rivers (August 1971) are given. In its 1971 progress report the Board identifies studies that have been initiated, proposes other future studies, and considers recommendations for modifications or additions to the control works. The 1972 progress report discusses effects of altered streamflows on the Burntwood River system, effects on the Southern Indian Lake fish station, and identifies potential recreational areas along the Diversion Route. The 1973 progress report includes some recommendations for mitigative measures along with additional study requirements. The section on Kiskitto Lake regulation recommends changes in control to accomodate wildlife, fisheries and recreation interests. The sections on timber clearing include general guidelines along with recommendations for specific areas and present an evaluation of timber clearing as a measure for mitigating effects of flooded timber. The section on long-term monitoring discusses the monitoring and assessment to be undertaken by a multiagency study team to evaluate the changes occurring in the vegetation, wildlife, soils and water elements of representative ecosystems in the impact areas. The sections on preflood clearing provide guidelines for

clearing along, with specific recommendations for clearing of vegetation along Southern Indian Lake and the Diversion Route.(au)

504 (069359)
Appendix 2, hydrologic, hydraulic and geomorphologic studies, Vol. 1 * Lake Winnipeg, Churchill & Nelson Rivers Study Board * 1976? * vp

The physical impact study deals with the physical impact on shorelines and inundated terrain resulting from the interbasin transfer of water from the Churchill River to the Nelson River and the regulation of flow in the Nelson River by Jenpeg. A study of the shoreline processes on the south pool of Lake Winnipeg was conducted to determine the effects arising from Lake Winnipeg water level regulation and includes the effect of sand movement and of ice on the shoreline and shoreline structures. The plans and specifications prepared by Manitoba Hydro for the bypass channels of the Lake Winnipeg regulation project including the South Bay channel were studied in order to provide data describing changes to the physical environment resulting from construction. The probable condition of the ice cover on Southern Indian Lake under future diversion conditions was estimated by analyzing available data and by reference to previous work by others. An assessment of the post-diversion ice regime of the Churchill River between Missi Falls and the estuary, with emphasis on the lower reach of the river downstream of Little Churchill River, is included. Some indication is provided as to what might be expected to happen to the water levels and flows in the east channel below Sea River Falls with reduced flow. The results of a water sampling program in northern Manitoba, 1972 to 1974, from 26 water sampling stations are presented in tabular form. Information is provided on the water levels and flows based on projections without the projects in place and on projections with the projects in place. Topographic maps of the south basin of Lake Winnipeg between Riverton and Traverse Bay have been prepared from the shoreline to 3000 feet inland and presents the shoreline at several different points in time.(au)

505 (069351)
Appendix 2, hydrologic, hydraulic and geomorphologic studies, Vol. 2 * Lake Winnipeg, Churchill and Nelson Rivers Study Board * nd * vp

This appendix contains four hydrologic, hydraulic and geomorphologic studies in data form of northern Manitoba. Specific topics covered include results of a water sampling program in northern Manitoba 1972-1974; water level and flow information in the Lake Winnipeg/Churchill River/Nelson River area; Lake Winnipeg south basin mapping project; and the Rat-Burntwood rivers system mapping project.

506 (069352)
Appendix 3, biophysical, forestry and geological studies * Lake Winnipeg, Churchill & Nelson Rivers Study Board * 1976? * vp

A biophysical land inventory of three major areas in the Churchill-Nelson rivers system, which were expected to be affected by man-made changes in water levels, was conducted to provide basic data on the nature and form of surficial deposits, soils, vegetation, and water bodies in a manner suitable for the interpretation or evaluation of land for forestry, wildlife, recreation, and engineering. The survey areas, particularly the Southern Indian Lake and Rat-Burntwood rivers areas, were found to have a relatively fragile ecological balance. Brief descriptions of forest cover along Southern Indian Lake, the Diversion and Burntwood River system and the west and bypass channels of the Nelson River and survey methods are given. A detailed examination of land area and wood volume to be lost is given based on status of land and further subdivided by amount to be flooded, and amount to be lost through channel construction. The chief detrimental effect is the loss of productive forest area which reduces the allowable annual cut over future years. An investigation was carried out into the reaction of existing tree cover to the probable changed soil moisture condition along the shore of two existing reservoirs, Cedar, Cross and Sipiwesk lakes. The study was designed to enable inferences as to the future effects of flooding on the growth of trees adjacent to the new shoreline of the Jenpeg Forebay. The west channel reservoir clearing program is described.

507 (069353)
Appendix 4, existing works and services * Lake Winnipeg, Churchill & Nelson Rivers Study Board * 1976? * vp

The report contains results of the investigations of the effects of proposed hydroelectric power development on existing works and services along the Lake Winnipeg, Churchill-Nelson rivers systems. Effects of Lake Winnipeg regulation, on the temporary dyking system around the southern portion of the lake are examined. The report also contains the results of investigations in the Norway House, Cross Lake, Southern Indian Lake and Rat-Burntwood Diversion Route and areas affected by Lake Winnipeg regulation concerning the assessment of real property that could be affected by the proposed hydroelectric power development. Information on the classification of existing shoreline and the anticipated effects of raised lake levels in the Cross Lake community is provided. This study also evaluated the present regime of the Burntwood River near Thompson, the state of the river banks, and the extent of low-lying facilities, and then predicts the effect of increasing the flow to a maximum of 35 000 cfs. Effects on shorelines, buildings and roads in the community of Nelson House are discussed. The report includes the evaluation of the effects of regime changes on the quality and quantity of water available for domestic, municipal and industrial use in the communities along the Nelson River outlet lakes, the Churchill River and the Diversion Route.

508 (070015)
Appendix 5, fisheries and limnology studies, Vol. 1 * Lake Winnipeg, Churchill & Nelson Rivers Study Board * vp

This volume contains the following reports on Southern Indian Lake: an examination of the fisheries and limnology as they exist prior to hydroelectric development and predictions of the effects of raised levels and changes in flow patterns on the aquatic ecosystem and the commercial fishery; morphometry of the lake: present conditions and implications of hydroelectric development; sedimentary environments, recent basin history and implications of inundation and diversion; surveys of phytoplankton, primary productivity, zooplankton and zoobenthos; present conditions of the fisheries and implications of hydroelectric development; and exploitation and reproduction data on the fisheries.

509 (069354)
Appendix 5, fisheries and limnology studies, Vol. 2 * Lake Winnipeg, Churchill and Nelson Rivers Study Board * 1976? * vp

The report examines the fisheries and limnology of Nelson River outlet lakes, Southern Indian Lake, lower Churchill River and along Diversion Route prior to the proposed Lake Winnipeg, Churchill-Nelson rivers hydroelectric development, and it attempts to predict the effects of the raised levels and changes in flow patterns on the aquatic ecosystem and particularly on the commercial fishery. The morphometry, chemical limnology and hydrography of lakes and rivers in the study area, and present conditions are described and implications of the proposed hydroelectric developments are discussed. Numerous sediment collections were made. Knowledge of the present and past patterns of sedimentation is used in an attempt to forecast the eventual fates of sediments which will become available from shoreline erosion after inundation and diversion. Results of phytoplankton, zooplankton and zoobenthos surveys along with predictions of productivity following diversion are provided. The existing data on the fisheries are presented and discussed, and recommendations with respect to these data are put forward. Predictions of changes in fish production at specific sites throughout the area affected by the hydroelectric power development are included. Some mitigative measures to reduce impacts on commercial fishermen are proposed.(au)

510 (069355)
Appendix 6, wildlife studies * Lake Winnipeg, Churchill and Nelson Rivers Study Board * nd * vp

This report considers wildlife impact assessment, mitigation and enhancement possibilities associated with the proposed Lake Winnipeg, Churchill and Nelson rivers hydroelectric power development. Data were gathered through the process of aerial surveys of waterfowl and ungulates, and assimilation of data from reports, interviews, and personal observations. In the Nelson River outlet lakes area, wildlife issues identified as most significant were loss of trapping potential, waterfowl habitat disturbance, moose habitat loss, and increased harvest rates for big game close to settlements. In the Southern Indian Lake area the most important issues are loss of marsh habitat, loss of trapping potential, loss of gull and tern nesting islands, time required for reestablishment of shorelines and the effects on casual moose hunting opportunities by natives. In the Lake Winnipeg area, the most important potential issues identified were stagnation of marshes with higher, more stable levels and periodic loss of some smaller satellite islands used by colonial nesting birds. In the Rat-Burntwood system and along the lower Churchill River, the major issues identified in the areas were loss of riparian wildlife habitat; loss of furbearers and destruction of habitat; loss of marsh habitat; length of time for reestablishment of productive habitat; collection of debris in bays with low shorelines by a booming process; loss of shoreline hunting opportunity by natives; conflict between sport and native hunting; harassment of wildlife during construction and clearing phases; and loss of income through trapping.(au)

511 (069358)
Appendix 7, recreation and archaeological studies * Lake Winnipeg, Churchill and Nelson Rivers Study Board * 1976? * vp

This appendix contains information on recreation and archaeological studies prepared by the Lake Winnipeg, Churchill and Nelson Rivers Study Board to assess the impact of hydroelectric power development within the study area. A recreational use demand study of Lake Winnipeg was carried out. Data on recreational habits of Greater Winnipeg residents is included. Demand trends for forecasting future needs for recreational facilities were developed for the whole province and specifically for the Lake Winnipeg study area. An inventory of potential recreation sites was prepared for the Nelson River outlet lakes area. Sites along the Diversion Route were studied to assess their potential for recreation. The impact of water regime changes on identified recreation sites on Southern Indian Lake were assessed. Recommendations were made to mitigate losses and enhance benefits to recreation derived from the hydroelectric developments. The feasibility of establishing additional recreation opportunities was considered. The recreational potential along the lower Churchill River and the impact from hydroelectric developments was only briefly assessed. An evaluation of the archaeological resources in the Kiskittogisu Lake and along the Rat-Burntwood Diversion and the effects of the Diversion on these resources are provided in this report.

512 (069356)
Appendix 8, social and economic studies, Vol. 1 * The Lake Winnipeg, Churchill and Nelson Rivers Study Board * xviii, 490p

This study attempts to predict changes which are likely to be either imposed or accelerated as a result of hydro development and to recommend ways in which appropriate community adjustments may be facilitated.

An overview is given of problems associated with northern development and the economic and social implications of hydro development are discussed. An analysis is presented of current economic and social structures of the Cross Lake, Nelson House, Southern Indian Lake and other communities in northern Manitoba, in order to provide a baseline against which to assess the impact of development on these communities.

513 (070029)
Appendix 8, social and economic studies, Vol. 2 * Lake Winnipeg, Churchill & Nelson Rivers Study Board * vp

This report presents information and data on the social and economic characteristics of the Cross Lake and Nelson House communities in northern Manitoba. A detailed study of the possible social and economic impacts of the Nelson River hydroelectric development includes a community profile of Southern Indian Lake, its residents and the economy.

514 (069357)
Appendix 8, social and economic studies, Vol. 3 * Lake Winnipeg, Churchill and Nelson Rivers Study Board * nd * vp

This appendix contains eight papers relating to the potential social and economic impacts of hydroelectric power projects on northern Manitoba communities. Specific topics include social change and stress with a focus on northern development; a proposal for a northern Manitoba native cultural centre or museum; the impact of development on nutrition in remote northern Manitoba communities; simulation of alternatives for the Southern Indian Lake commercial fishery; report on Indian Affairs Branch human resource survey; report on socioeconomic data sources for selected northern Manitoba communities; social impact program; and a literature review relating to the socioeconomic impact on native people.

9.2.2 Nelson River / Fleuve Nelson

Final report / Rapport définitif

515 (022317)
Technical report (see entry number 500 for complete reference)

Summary report / Sommaire

516 (F14476)
COMMISSION D'ÉTUDE DU LAC WINNIPEG, DE LA RIVIÈRE CHURCHILL ET DU FLEUVE NELSON * ***Commission d'étude du lac Winnipeg, de la rivière Churchill et du fleuve Nelson, Canada, Manitoba, avril 1975 : rapport sommaire*** (voir 501 pour la référence)

517 (069363)
Summary report (see entry number 502 for complete reference)

Appendices and supplements / Appendices et suppléments

518 (069350)
Appendix 1, background documents and interim reports (see entry number 503 for complete reference)

519 (069359)
Appendix 2, hydrologic, hydraulic and geomorphologic studies, Vol. 1 (see entry number 504 for complete reference)

520 (069351)
Appendix 2, hydrologic, hydraulic and geomorphologic studies, Vol. 2 (see entry number 505 for complete reference)

521 (069352)
Appendix 3, biophysical, forestry and geological studies (see entry number 506 for complete reference)

522 (069353)
Appendix 4, existing works and services (see entry number 507 for complete reference)

523 (070015)
Appendix 5, fisheries and limnology studies, Vol. 1 (see entry number 508 for complete reference)

524 (069354)
Appendix 5, fisheries and limnology studies, Vol. 2 (see entry number 509 for complete reference)

525 (069355)
Appendix 6, wildlife studies (see entry number 510 for complete reference)

526 (069358)
Appendix 7, recreation and archaeological studies (see entry number 511 for complete reference)

527 (069356)
Appendix 8, social and economic studies, Vol. 1 (see entry number 512 for complete reference)

528 (070029)
Appendix 8, social and economic studies, Vol. 2 (see entry number 513 for complete reference)

529 (069357)
Appendix 8, social and economic studies, Vol. 3 (see entry number 514 for complete reference)

10. CHURCHILL RIVER BASIN / BASSIN VERSANT DE LA RIVIÈRE CHURCHILL

Final report / Rapport définitif

530 (039478)
CHURCHILL RIVER STUDY (MISSINIPE PROBE) • ***Churchill River study synthesis*** • Saskatchewan Department of the Environment, Saskatoon, Sask • 1976 • 215p

This report describes the findings of the Churchill River Study. The study was undertaken to investigate the potential impacts of the Wintego hydroelectric development, which was proposed by the Saskatchewan Power Corporation, on the Churchill River in Saskatchewan. The report condenses the findings of 31 final reports, presents a summary of findings, presents a condensed impact statement and describes the natural and human environment of the study area. The details of the proposal are presented, and the potential effects on the local people and the environment are discussed.

531 (022317)
Technical report (see entry number 500 for complete reference)

Summary report / Sommaire

532 (039477)
CHURCHILL RIVER STUDY (MISSINIPE PROBE) • ***Churchill River study summary*** • Saskatchewan Department of the Environment, Saskatoon, Sask • 1976 • 52p

This report summarizes the findings of the Churchill River Study. The study was undertaken to investigate the potential impacts of the Wintego hydroelectric development, as proposed by the Saskatchewan Power Corporation, on the Churchill River in Saskatchewan. The summary presents the most important findings of the Churchill River Study, which are presented in more detail in the synthesis and final report 31.

533 (F14476)
COMMISSION D'ÉTUDE DU LAC WINNIPEG, DE LA RIVIÈRE CHURCHILL ET DU FLEUVE NELSON • ***Commission d'étude du lac Winnipeg, de la rivière Churchill et du fleuve Nelson, Canada, Manitoba, avril 1975 : rapport sommaire*** (voir 501 pour la référence)

534 (069363)
Summary report (see entry number 502 for complete reference)

Appendices and supplements / Appendices et suppléments

535 (069350)
Appendix 1, background documents and interim reports (see entry number 503 for complete reference)

536 (069359)
Appendix 2, hydrologic, hydraulic and geomorphologic studies, Vol. 1 (see entry number 504 for complete reference)

537 (069351)
Appendix 2, hydrologic, hydraulic and geomorphologic studies, Vol. 2 (see entry number 505 for complete reference)

538 (069352)
Appendix 3, biophysical, forestry and geological studies (see entry number 506 for complete reference)

539 (069353)
Appendix 4, existing works and services (see entry number 507 for complete reference)

540 (070015)
Appendix 5, fisheries and limnology studies, Vol. 1 (see entry number 508 for complete reference)

541 (069354)
Appendix 5, fisheries and limnology studies, Vol. 2 (see entry number 509 for complete reference)

542 (069355)
Appendix 6, wildlife studies (see entry number 510 for complete reference)

543 (069358)
Appendix 7, recreation and archaeological studies (see entry number 511 for complete reference)

544 (069356)
Appendix 8, social and economic studies, Vol. 1 (see entry number 512 for complete reference)

545 (070029)
Appendix 8, social and economic studies, Vol. 2 (see entry number 513 for complete reference)

546 (069357)
Appendix 8, social and economic studies, Vol. 3 (see entry number 514 for complete reference)

Miscellaneous reports / Rapports divers

547 (032105)
RENGER, K.J. * ***Hydro-electric (Manitoba)*** * Churchill River Study (Missinipe Probe), Saskatoon, Sask * 1975 * 18p * (Final report 1)

This report examines the potential impact of the Wintego hydroelectric project, which was proposed by the Saskatchewan Power Corporation, on hydroelectric operations in Manitoba. Manitoba Hydro has expressed an interest in the Wintego proposal, particularly because of potential impacts on their plans to divert the Churchill River into the lower Nelson River via the Rat and Burntwood rivers.

548 (032106)
HOFER, R.D. * ***Hydrology (Saskatchewan)*** * Churchill River Study (Missinipe Probe), Saskatoon, Sask * 1975 * 61p * (Final report 2)

This report describes the results of an investigation of the hydrology study sector into the hydrology of the Churchill River Basin. The purpose of their investigation was to examine the streamflow records and lake levels of the Churchill River system for the period 1929 to 1972. Projected water levels were developed for several modes of operation - with and without present impoundments and the Wintego hydroelectric project, which was proposed by the Saskatchewan Power Corporation.

549 (032107)
HOFER, R.D. * ***Climate*** * Churchill River Study (Missinipe Probe) Saskatoon, Sask * 1975 * 47p * (Final report 3)

This report describes the investigations that were carried out to provide climatic information for the assessment of the Wintego hydroelectric project, which was proposed by the Saskatchewan Power Corporation. Climatic information such as monthly temperatures, precipitation, evaporation and wind were examined. Potential wave heights were also determined. Deficiencies were identified in the climatic data base.

550 (032108)
KABZEMS, A.; BERNIER, D.L. * ***Forestry*** * Churchill River Study (Missinipe Probe) Saskatoon, Sask * 1975 * 94p * (Final report 4)

This report examines the effect that the Wintego hydroelectric project, proposed by the Saskatchewan Power Corporation, would have on forestry in the reservoir area. Information is provided on the land capability for forestry, the distribution of forest types and the volume of wood within the proposed reservoir area. Various types and costs of land clearing are examined.

551 (032109)
HEILMAN-TERNIER, J.; HARMS, V.L. * ***Plant ecology-taxonomy*** * Churchill River Study (Missinipe Probe) Saskatoon, Sask * 1975 * 126p * (Final report 5)

This report provides an ecological description of plant communities living in areas that may be affected by the Wintego hydroelectric project, which was proposed by the Saskatchewan Power Corporation. Work began on this sector after it became apparent that there was no sector of the Churchill River Study involved in an assessment of present and future vegetation in the area. The objectives of the study were to classify and describe the wetland and forest vegetation in the area, to obtain a complete floristic documentation through a collection of plant species and to predict the nature of the impact of the proposed Wintego project on present vegetation and the establishment of new wetland types. However, the report concludes that the results should be viewed as preliminary because more detailed ecological and floristic studies are required.

552 (032110)
STEWART, W.D.; FORAIE, J. * ***Transportation*** * Churchill River Study (Missinipe Probe) Saskatoon, Sask * 1975 * 256p * (Final report 6)

This report provides an investigation into the potential impacts that additional transportation routes would have in conjunction with the development of the Wintego hydroelectric project, which was proposed by the Saskatchewan Power Corporation. The report documents what transportation facilities and operations exist in the study area and presents a number of recommendations concerning the possible extension of transportation facilities in the area.

553 (032111)
BOWERING, R.J. * ***Hydrology (Manitoba)*** * Churchill River Study (Missinipe Probe) Saskatoon, Sask * 1975 * 45p * (Final report 7)

This report examines how the Wintego hydroelectric project on the Churchill River, which was proposed by the Saskatchewan Power Corporation may affect flows and water level regimes of the Churchill River and its lakes from the Saskatchewan border to Southern Indian Lake. A comparison of 16 proposed regulation schemes is made.

554 (032112)
LIAW, W.K.; O'CONNOR, J.F. * ***Impact on five Churchill River lakes*** * Churchill River Study (Missinipe Probe) Saskatoon, Sask * 1975 * 198p * (Final report 8)

This report provides baseline physical-chemical characteristics of Drinking, Keg, Trade, Uskik and Ouram lakes of the Churchill River system in Saskatchewan. An assessment of abundance of plants, plankton, benthos, and fish species is undertaken. The potential effects of the Wintego hydroelectric project, which was proposed by the Saskatchewan Power Corporation, on the commercial and sports fisheries is evaluated. Recommendations and mitigation measures are proposed concerning the operation of the proposed reservoir.

555 (052199)
SAWCHYN, W.W. * ***Impact on the Reindeer River and four Churchill River lakes*** * Chemistry Division, Saskatchewan Research Council, Saskatoon, Sask * 1975 * 260p * (Final Report 9)

This report provides a documentation of the morphometric characteristics of the Reindeer River and the reach of the Churchill River between the Reindeer-Churchill confluence and Pikoo Lake. The physical and chemical properties and the diversity and productivity of plankton, bottom fauna and fish were investigated during the summers of 1973 and 1974. Recommendations and mitigation measures are proposed concerning the operation of the reservoir of the Wintego hydroelectric project, which was proposed by the Saskatchewan Power Corporation.

556 (032113)
DEAN, E.L. * ***Aquatic ecology and fisheries in Reindeer Lake*** * Churchill River Study (Missinipe Probe) Saskatoon, Sask * 1975 * 181p * (Final report 10)

This report was prepared to describe the morphometry, physical-chemical characteristics, and biological communities of Reindeer Lake, which may be affected by the Wintego hydroelectric development, proposed by the Saskatchewan Power Corporation. Comparisons are made between the biological populations described by the present study and data collected in earlier surveys. Fishery records and statistics are examined to estimate the degree of under- or over-utilization of the fishery resource by the commercial, domestic and sports fisheries.

557 (032114)
PATALAS, K.; SALKI, A. * ***Crustacean plankton in Reindeer Lake*** * Churchill River Study (Missinipe Probe) Saskatoon, Sask * 1975 * 76p * (Final report 11)

This report describes the results of field investigations into the species composition and horizontal distribution of crustacean plankton in Reindeer Lake, which may be affected by the Wintego hydroelectric development proposed by the Saskatchewan Power Corporation. This study was undertaken to supplement other fisheries -- related components of the Churchill River Study. Limnological characteristics of Reindeer Lake were tabulated, and the lake was delineated into eight distinct zones.

558 (032115)
HECKY, R.E. * ***Sediments in Sokatisewin and Reindeer lakes*** * Churchill River Study (Missinipe Probe) Saskatoon, Sask * 1975 * 56p * (Final report 12)

This report deals with a paleolimnological study of Sokatisewin and Reindeer lakes of the Churchill River system. These lakes were studied to be able to predict sedimentation changes that would occur as a result of the Wintego hydroelectric project, which was proposed by the Saskatchewan Power Corporation. The study found that because the hydrological operation of the Wintego Reservoir would be similar to that of Reindeer and Sokatisewin lakes, a number of predictions can be made about the effects that sedimentation may have on the proposed Wintego Reservoir.

559 (032116)
LAWRENCE, J.R. * ***Primary production in Churchill and Reindeer River lakes*** * Churchill River Study (Missinipe Probe) Saskatoon, Sask * 1975 * 20p * (Final report 13)

This report was undertaken to determine the relationship between the primary production of phytoplankton and a number of environmental factors that would be affected by the Wintego hydroelectric development on the Churchill River, which was proposed by the Saskatchewan Power Corporation. Pre-impoundment primary production in the study area was measured at Drinking Lake on the Churchill River and at Steephill Lake on the Reindeer River. Post-impoundment conditions were measured at Sokatisewin Lake, which is the Island Falls Reservoir. Short- and long-term predictions are made concerning possible changes in primary production should the Wintego project proceed.

560 (032117)
WILLARD, J.R. * ***Benthic fauna in Sokatisewin Lake*** * Churchill River Study (Missinipe Probe) Saskatoon, Sask * 1975 * 54p * (Final report 14)

This study was carried out to compare the benthic invertebrate populations in flooded areas of the Churchill-Reindeer rivers system. Benthic populations in Sokatisewin Lake (the Island Falls Reservoir) which has been flooded for 45 years were compared with those in unflooded lakes on the system, to predict changes that could occur if the Wintego hydroelectric development proposed by the Saskatchewan Power Corporation, were to proceed. Possible changes in the benthic populations are discussed.

561 (032118)
HUANG, P.M.; LIAW, W.K. * ***Sediments in Drinking Lake*** * Churchill River Study (Missinipe Probe) Saskatoon, Sask * 1975 * 20p * (Final report 15)

This report documents an investigation into the nature and properties of present lake sediments of Drinking Lake of the Churchill River system and how the Wintego hydroelectric development, which was proposed by the Saskatchewan Power Corporation, could impact on the aquatic ecosystem. Sediments from the deep-water zone of Drinking Lake were analysed for particle size distribution, selected chemical properties and mineral components. The report concludes that the deposition of colloidal particles would increase after the construction of the Wintego impoundment and also modify chemical constituents of the water. However, because this phenomenon is complex, a better understanding requires further investigation.

562 **(032119)**
DERKSEN, A.J. • ***Fisheries (Manitoba)*** • Churchill River Study (Missinipe Probe) Saskatoon, Sask • 1975 • 256p • (Final report 16)

The present report considers the fisheries resources of the part of the Churchill River in Manitoba upstream from Leaf Rapids and identifies the potential impact of the Wintego hydroelectric development, which was proposed by the Saskatchewan Power Corporation on these resources. Fishery resources of several lakes on the lower part of the Hughes River, a tributary to the Churchill River, were also examined. The discussion is based largely on data obtained from Manitoba government files and with some field surveys that were conducted on the Hughes River lakes in July 1974. Information presented in this report includes data on lake morphometry, water quality, commercial, recreational and domestic fisheries, and lake productivity. The report estimates that the commercial fish production of the Churchill River lakes could be affected severely. However, further studies are recommended to determine more precisely the effects that the proposed Wintego project may have on fisheries in Manitoba.

563 **(032120)**
LANGFORD, F.F. • ***Geology*** • Churchill River Study (Missinipe Probe) Saskatoon, Sask • 1975 • 131p • (Final report 17)

This report discusses how the Wintego hydroelectric project, which was proposed by the Saskatchewan Power Corporation, would affect surficial deposits upstream. A limited program of field work and aerial reconnaissance was carried out and supplemented with earlier work. The report points out that basic data on existing conditions and rates of change are lacking, and additional geological investigations and impact surveys are required before a plan to ameliorate the effects of the proposed impoundment can be developed. However, the report concludes that as a whole, the shoreline of the proposed Wintego Reservoir would be fairly insensitive to flooding.

564 **(032121)**
LARSEN, R.H.; MCKAY, D.S. • ***Recreation (Saskatchewan)*** • Churchill River Study (Missinipe Probe) Saskatoon, Sask • 1975 • 134p • (Final report 18)

This report assesses the physical capability of the Churchill River Study area (CRS) for outdoor recreation on the basis of present conditions and potential conditions that would result after the construction of the Wintego hydroelectric development, proposed by the Saskatchewan Power Corporation. The area was surveyed and classified according to its recreation potential using information from other CRS sectors, literature searches, and from a 1973-1974 field work program. The report found that the present attractiveness of the falls and rapids, which are the focus of scenic interest, greatly exceeds the attractiveness of a man-made reservoir. It concludes that the proposed reservoir would have a lower recreational capability than the present river system. The alternative of designating parts of the proposed reservoir area as wilderness and historic area is discussed.

565 **(032122)**
MEYERS, D.; SMAILES, S.J. • ***Archaeology*** • Churchill River Study (Missinipe Probe) Saskatoon, Sask • 1975 • 121p • (Final report 19)

This report describes an investigation into the presence of archeological remains within the area that would become flooded by the Wintego hydroelectric development, which was proposed by the Saskatchewan Power Corporation. A total of 341 sites were investigated with some as old as 2000 years. Most of the field work concentrated on a site survey of the area, and therefore little formal excavation was carried out. It was possible only to complete the survey for one half of the proposed reservoir area. The report recommends that if the reservoir proposal were to proceed, the site survey should be completed and additional investigations and salvage operations should be carried out.

566 **(032123)**
KOONZ, W.H.; STOREY, D.R. • ***Wildlife Manitoba*** • Churchill River Study (Missinipe Probe) Saskatoon, Sask • 1975 • 110p • (Final report 20)

This report discusses an investigation into the effects that the proposed Wintego hydroelectric project, proposed by the Saskatchewan Power Corporation, would have on Manitoba wildlife. A field-work program undertaken in 1973-74 provided most of the information. Only the wildlife species of socioeconomic importance were studied in detail because of limitations in time and resources. The study area was subdivided into three smaller areas, namely the Churchill River, Reindeer River and Hughes River areas. The report concludes that potential regulated flows could seriously affect wildlife that is sustained in an environment where average monthly flows vary seasonally between 10 000 and 50 000 cfs. However, this may be an asset to colonial-nesting birds.

567 (032124)
COLLINSON, J.D.; ERYOU, D.; KABALUK, R.; COMPTON, F.H.; FIELDS, G.; PASTUCK, H.; DUNCAN, M. * ***Socio-economic (Manitoba)*** * Churchill River Study (Missinipe Probe) Saskatoon, Sask * 1975 * 262p * (Final report 21)

This report describes the possible social and economic effects of construction of the Wintego hydroelectric development, proposed by the Saskatchewan Power Corporation, on Manitoba. Community profiles were prepared for Brochet, Pukatawagan and Granville lakes. Comparisons are made between the communities, the study area, and the province of Manitoba.

568 (032125)
LAMB, J. * ***Recreation (Manitoba)*** * Churchill River Study (Missinipe Probe) Saskatoon, Sask * 1975 * 81p * (Final report 22)

This study is an assessment of the recreational resources of the Churchill River from the Manitoba-Saskatchewan boundary to the town of Leaf Rapids. The objective of this study was to provide a baseline identification and assessment of present land and water capability for recreation in the study area and then to assess the possible effects that changes in the water regime, associated with the Wintego hydroelectric development, proposed by the Saskatchewan Power Corporation, would have. An inventory of the study area was carried out by aerial reconnaissance and ground surveys. The report concluded that the proposed Wintego project would have insignificant effects on the recreation resources in Manitoba if fluctuations in stage are comparable to the fluctuations associated with operation of the Island Falls Reservoir. However, concerns were expressed regarding minimum flows during the construction and filling of the proposed Wintego Reservoir.

569 (032126)
MUIR, T.; OULD, P.; PENNER, F. * ***Physical impact Reindeer Lake Manitoba*** * Churchill River Study (Missinipe Probe) Saskatoon, Sask * 1975 * 163p * (Final report 23)

This report documents an investigation into the effects that the construction of the Wintego hydroelectric project, proposed by the Saskatchewan Power Corporation, would have on physical aspects of Reindeer Lake in Manitoba. A survey was conducted to estimate the effect of higher water levels on the diversity of shoreline types. The effects on real estate are discussed along with the need for compensation for loss. The problem of floating debris and timber is addressed within the context of affecting the commercial fishery and boater safety. The effects of water regimes different from the original proposal are considered in an addendum.

570 (032127)
STABLER, J.C.; ST LOUIS, L.V.; GLOVER, L.J.; HOWARD, S.M.; MACINTOSH, M.T. * ***Cost-benefit analysis (Saskatchewan)*** * Churchill River Study (Missinipe Probe) Saskatoon, Sask * 1975 * 155p * (Final report 24)

This report describes a cost-benefit assessment of Saskatchewan Power Corporation's proposal to utilize the Churchill River for hydroelectric power generation at the Wintego site. An econometric model was developed to permit assessment under a variety of simulated future circumstances. The demand for electrical energy in Saskatchewan, indirect effects, direct plus indirect benefit-cost ratios and the results of a sensitivity analysis are reported. The economics of Saskatchewan Power Corporation's modified proposal, which consisted of lowering the full service level of Reindeer Lake from 1107 feet above sea level to 1104.5 feet, are determined. The benefit-cost ratios indicated that the proposals were viable under all future scenarios considered.

571 (032128)
STABLER, J.C.; BECK, R.G.; WARNER, J.A.; RUSSELL, D.; OLFERT, M.R.; HOWARD, S.M.; TUCK, A. * ***Socio-economic (Saskatchewan)*** * Churchill River Study (Missinipe Probe) Saskatoon, Sask * 1975 * 465p * (Final report 25)

This report provides an analysis of the social and economic impact that construction of the Wintego hydroelectric project, which was proposed by the Saskatchewan Power Corporation, would have on the inhabitants of the surrounding area. A profile, prepared using available information related to the socio-economic characteristics of the community of Sandy Bay, is discussed because there may be parallels between the Island Falls hydroelectric development, which began in 1930, and the proposed Wintego project. The report concludes that, locally, construction of the Wintego Dam would be beneficial in some respects, and detrimental in others. Although no reserve lands or communities would be affected directly, the increased frequency and intensity of contacts with whites would likely increase social stress. Most residents who were contacted view the proposal with apprehension or outright opposition.

572 (032129)
BALDWIN, R.P. * ***Mapping*** * Churchill River Study (Missinipe Probe) Saskatoon, Sask * 1975 * 24p * (Final report 26)

This report describes the mapping program that was carried out to provide base maps of the area that could be affected by the Wintego hydroelectric development, proposed by the Saskatchewan Power Corporation. The base maps were to be used in other sectors of the Churchill River Study. Fifty-five rectified aerial mosaic maps were prepared at a scale of 1:1000, a contour interval of 10 feet up to elevation 1200 and a contour interval of 20 feet beyond. Vertical control was established by both trigonometric and barometric levelling. Horizontal control was established from existing geodetic stations.

573 (032130)
MANITOBA DEPARTMENT OF MINES, RESOURCES AND ENVIRONMENTAL MANAGEMENT * ***Impact Manitoba*** * Churchill River Study (Missinipe Probe) Saskatoon, Sask * 1975 * 60p * (Final report 27)

This report was prepared to address the social and economic impact of the Wintego Hydroelectric project, which was proposed by the Saskatchewan Power Corporation, on Manitoba. The report discusses the project's potential impact under four alternative water regimes for the Wintego Reservoir, namely the Saskatchewan Power Corporation regime, the environmental regime, the Manitoba Hydro regime, and the historic regime. The report draws on the results of other Manitoba study sectors, namely wildlife, fisheries, physical impact, recreation and social and economic studies. The report concludes that the Manitoba Hydro regime and the environmental regime would be least detrimental to Manitoba interests if the Wintego project were to proceed.

574 (032131)
BARBER, S.R.; STELFOX, H.A.; BODEN, J.D. * ***Wildlife (Saskatchewan)*** * Churchill River Study (Missinipe Probe) Saskatoon, Sask * 1975 * 272p * (Final report 28)

This wildlife impact study was carried out to assess the impact that the Wintego hydroelectric development, proposed by the Saskatchewan Power Corporation, would have on Saskatchewan wildlife that depend on or utilize aquatic habitat of the Churchill River. Six primary objectives of the study were to determine the size distribution and productivity of wildlife populations, to determine the wildlife habitat requirements, to classify and map habitat capability, to predict the impact of the proposed hydroelectric development on populations, to place the populations and the study area in a regional, provincial or continental perspective, and finally to suggest possible mitigation measures. A field-work program which consisted of interviews with natives and aerial and ground surveys provided most of the data for this study. The report discusses the proposed development's potential impact on waterfowl, bald eagles and ospreys, colonial-nesting birds, other birds, mink, otter, muskrat, beaver, moose, caribou, deer, black bears, lynx, wolverine and other mammals. Mitigation possibilities are discussed, but the report states that the proposed developments would have a negative to strong negative impact on most species of birds and mammals that utilize aquatic habitat of the Churchill River.

575 (070024)
EPEC CONSULTING WESTERN LIMITED * ***Outdoor recreation and tourism demand*** * 1975 * xxii, 197p * (Churchill River Study (Missinipe Probe) Final report, 29)

This study was undertaken to assess the degree of recreational use that may be anticipated with the Churchill River Wintego hydroelectric development, proposed by the Saskatchewan Power Corporation, and the degree of recreational use that may be anticipated under existing conditions. Existing recreational facilities and outdoor recreation characteristics of the surrounding area are described. A survey questionnaire was developed and distributed throughout the southern half of Saskatchewan to determine the preferences and desirability of canoeing and to estimate changes in visitation that can be anticipated with the construction of the proposed Wintego Dam. The report predicts that intensive recreational use would be higher than extensive use, whether or not the proposed dam is built. If the dam was built, extensive recreational use will be lowered considerably.(au)

576 (070026)
DODDS, W.E.; LANE, B. * ***Public participation program*** * 1976 * vp * (Churchill River Study (Missinipe Probe) Final report, 30)

This report describes the purpose and results of the public participation program that was initiated to inform the public of Saskatchewan Power Corporation's proposal to construct a hydroelectric development at Wintego Lake. The report is divided into three parts. Part 1 deals with the public participation program in general. Part 2 focuses on the responses received from the public during the course of the investigations. Part 3 presents the results of a questionnaire survey which was carried out by the Saskatchewan Department of Environment. The objectives of the program were to provide a mechanism whereby the public could learn of both the proposal and the study, to promote public interest and to foster mutual activities between the public and the study. Although the program did create an awareness of the proposed hydroelectric development, public input into the conduct of the study was judged to be only marginally successful.(au)

577 (070025)
DAVIS, E. * ***Water quality*** * 1976 * xii, 62p * (Churchill River Study (Missinipe Probe) Final report, 31)

This study was carried out to determine existing water quality conditions at selected locations within the area that may be affected by the Wintego hydroelectric development on the Churchill River, as proposed by the Saskatchewan Power Corporation. Other objectives were to identify potential adverse effects on water quality and to provide possible alternatives or solutions. Existing physical and chemical parameters, applicable to the area, are documented. A sampling program at selected locations on the Churchill and Reindeer rivers and Reindeer Lake provided additional data on physical and chemical water quality parameters. The results of studies on muskeg water, soil immersion, diurnal variation and organic matter loading are discussed. The report does not envisage significant or chemical changes in the physical or chemical water quality parameters resulting from the construction of the dam, except for a strong initial potential for oxygen depletion. The report recommends that

consideration be given to expanding the water quality monitoring program, to study the local and overall impact of flooding in the presently forested area.(au)

578 (069367)
STABLER, J.C.; BECK, R.G.; WARNER, J.; RUSSELL, D.; OLFERT, R.; HOWARD, S.; TUCK, A. * ***Socio-economic impact report : final report*** * July 1975 * vp

This report provides an analysis of the social and economic impact that construction of a dam at Wintego Lake on the Churchill River would have on the inhabitants of the surrounding area. A profile was prepared gathering and updating all available information on the socioeconomic characteristics of the study area. Comparative studies show that northern Saskatchewan still lags far behind southern Saskatchewan. Per capita income gains have been dependent on increased transfer payments and income remains below the poverty line. Rapid population growth has long since outrun the ability of the traditional economy to provide even a subsistence standard of living. Attemps to ensure meaningful participation in large-scale mining and forestry developments or to create economic alternatives to the inadequate opportunities provided by the traditional occupations were limited and ineffective. Locally, the construction of Wintego Dam would be beneficial in some respects and detrimental in others. Short-run opportunities in construction and supporting activities could be substantial if governments were careful to ensure native participation. Valuable experience and upgrading of skills could result, but long-term employment opportunities would be minimal. Increased frequency and intensity of contacts with whites during the construction period would likely increase social stress. Although no communities or reserves would be flooded, several dozen traplines would be. In spite of the limited physical disruption to the communities that would accompany the construction of the dam, most residents of the area who were contacted view the proposal with apprehension if not outright opposition.

ATLANTIC OCEAN / OCÉAN ATLANTIQUE

11. ST. LAWRENCE RIVER BASIN / BASSIN VERSANT DU FLEUVE SAINT-LAURENT

11.1 St. Lawrence River / Fleuve Saint-Laurent

Final report / Rapport définitif

579 (F14550)
COMITÉ D'ÉTUDE SUR LE FLEUVE SAINT-LAURENT; MINISTÈRE DE L'ENVIRONNEMENT DU QUÉBEC; ENVIRONNEMENT CANADA * ***Rapport du comité d'étude sur le fleuve Saint-Laurent*** * Comité d'étude sur le fleuve Saint-Laurent, Sainte-Foy, Qc * juil 1978 * 293p

Ce document présente les résultats d'une étude sur la qualité des eaux du fleuve Saint-Laurent entre Cornwall et Montmagny. On a analysé l'importance socio-économique du fleuve ainsi que les causes de détérioration de la qualité de ses eaux, soit: la dissémination des substances toxiques, la contamination bactériologique, l'abondance des sédiments en suspension, et l'enrichissement excessif en matières nutritives. On présente enfin des recommandations relatives à la conservation des ressources biologiques et la qualité de l'eau potable, à l'aménagement des berges, à l'utilisation des résidus de dragage, à l'assainissement des eaux usées municipales, à la réglementation des rejets industriels, à la lutte contre les déversements de mazout et enfin, à l'assainissement des tributaires.

580 (073152)
St. Lawrence River Study Committee : final report * 1978 * 209p

In order to resolve the conflict over uses of the St Lawrence River from Cornwall to Montmagny, the St Lawrence River Study Committee set up an action plan to protect, improve and restore the water quality in the river. A statement of the problem as it concerns the environment consists of an inventory of the uses that are dependent on quality, present deterioration of the river and its causes, as well as problems inherent to implementing such a plan. Descriptions are provided

of the physical environment, socioeconomic activities, and biological resources of the territory as well as analyses of the quality of the surface water, sediment, banks, and living environment. Recommendations involve the direct participation of the intervening government agencies in the program. Aspects of the program include treating municipal and industrial waste water and surface water of certain tributaries; developing recreation parks, conservation areas, and sites for dredging spoils disposal; investigating necessary equipment for improving domestic water supply treatment; and accidental oil spills cleanup. Proposed administrative actions include a shoreline conservation program, improving and enforcing legislation, information program, and monitoring and inventory programs.

Appendices and supplements / Appendices et suppléments

581 **(F14551)**
BÉRUBÉ, M. * ***Plan d'assainissement des eaux usées municipales : annexe no 1*** * Comité d'étude sur le fleuve Saint-Laurent * déc 1977 * 128p

Ce rapport expose les résultats d'une étude spéciale concernant un plan d'assainissement des eaux usées municipales entre Cornwall et Montmagny. De plus, on formule des commentaires sur la désinfection des eaux usées par chloration ou ozonisation, et sur les possibilités de disposer des boues résiduaires de traitement.

582 **(F14552)**
PINEAULT, G. * ***Plan de règlementation des rejets industriels : annexe no 2*** * Comité d'étude sur le fleuve Saint-Laurent * mars 1978 * 120p

Cette étude sur les rejets industriels directs ou indirects dans le fleuve Saint-Laurent a pour but d'identifier les principales sources de pollution des eaux. On met l'accent sur l'application de la meilleure technologie pratique, tant au niveau des méthodes de production que du traitement des eaux usées, afin de suggérer des solutions qui soient scientifiquement valables, ainsi que techniquement et économiquement réalisables. Quarante-cinq usines ont été sélectionnées aux fins de cette étude et leurs effluents ont été échantillonnés.

583 **(F14553)**
JEAN, D.; PROULX, L.; TERREAULT, J.A. * ***Plan d'intervention sur les tributaires : annexe no 3*** * Comité d'étude sur le fleuve Saint-Laurent * mai 1978 * 215p

Dans ce rapport, on identifie les causes principales des problèmes rencontrés à l'embouchure des tributaires du Saint-Laurent à l'aide de différents paramètres, dans le but éventuel d'une intervention visant l'amélioration de la qualité de l'eau du fleuve. Les neuf tributaires les plus importants au niveau débit et superficie qui sont décrits dans ce rapport sont: les rivières du Nord, des Outaouais, L'Assomption, Saint-Maurice, Châteauguay, Richelieu, Yamaska, Saint-François et Nicolet.

584 **(F14554)**
BARABÉ, G.; LAUZON, R. * ***Plan d'aménagement des berges du fleuve Saint-Laurent : annexe no 5*** * Comité d'étude sur le fleuve Saint-Laurent * mars 1978 * 139p

Dans ce rapport, on présente les données relatives aux propriétés du lit et des terrains riverains du fleuve Saint-Laurent, les données sur l'utilisation de ces terrains, leur potentiel biologique et récréatif, ainsi que sur la valeur esthétique du paysage. L'analyse des données a été effectuée en fonction des objectifs d'aménagement découlant des recommandations du rapport provisoire. Cette analyse a permis de faire ressortir les moyens d'intervention les plus efficaces et les plus rationnels pour l'aménagement des berges du fleuve Saint-Laurent.

585 **(F14555)**
Plan d'utilisation des matériaux dragués dans le fleuve Saint-Laurent : annexe no 6 * Comité d'étude sur le fleuve Saint-Laurent * mars 1978 * 177p

Les tronçons du fleuve Saint-Laurent sont soumis, à divers degrés, à des opérations de dragage, d'entretien et de construction. L'équipement utilisé comprend des dragues mécaniques pour les petits travaux et des dragues hydrauliques pour les travaux de plus grande envergure. Les incidences environnementales de ces travaux se manifestent aux sites de dragage et de dépôt. Il s'agit de la remise en suspension des sédiments, de la remise en disponibilité des éléments nutritifs et des substances toxiques, ainsi que de l'altération des habitats pour la faune et la flore. Les principales contraintes reliées à l'utilisation des matériaux dragués dans le but d'effectuer un aménagement favorable à la faune avienne et ichtyenne ainsi qu'à la récréation dépendent, entre autres, de la distance à parcourir entre les lieux de dragage et les sites à aménager. Les coûts additionnels encourus sont inhérents aux quantités de matériaux et à leur nature; ces deux facteurs doivent donc déterminer la technologie à utiliser. Quatorze projets d'aménagement sur une possibilité de 28 ont été retenus.

586 **(F14556)**
BRISEBOIS, P. * ***Plan d'amélioration des stations de traitement de l'eau potable : annexe no 7*** * Comité d'étude sur le fleuve Saint-Laurent * mars 1978 * 167p

Le fleuve Saint-Laurent, la rivière des Prairies et la rivière des Mille Îles servent de sources d'alimentation en eau potable à un grand nombre d'agglomérations. On y retrouve 41 prises d'eau. Comme ces cours d'eau reçoivent chaque jour des milliers de mètres cubes d'eaux usées, il y a lieu de vérifier l'influence de ces rejets sur la qualité de l'eau qui y est puisée pour être traitée et distribuée à des millions de Québécois. Cette étude traite, après révision de l'inventaire de l'équipement actuellement en opération pour rendre l'eau

potable, de la possibilité d'améliorer les modes de traitement.

587 (F14557)
RICARD, M.; RIVET, C. * ***Plan de lutte contre les déversements de produits pétroliers : annexe no 8*** * Comité d'étude sur le fleuve Saint-Laurent * mars 1978 * 98p

Le Comité d'étude sur le fleuve Saint-Laurent a commandité une étude afin de trouver des moyens pour protéger l'environnement des dommages résultant de déversements accidentels importants de pétrole dans le fleuve Saint-Laurent. Ce rapport décrit les principaux sites potentiels d'accidents, les moyens d'intervention actuellement disponibles, les différentes méthodes pour retirer le pétrole de la surface de l'eau, les problèmes qui peuvent être rencontrés ainsi que les projets d'amélioration des modes d'intervention pour lutter contre les effets de déversements de produits pétroliers.

588 (F14558)
DELISLE, A.; DESCOTEAUX, Y.; DENIS, M. * ***Le fleuve Saint-Laurent et les substances toxiques : annexe no 9*** * Comité d'étude sur le fleuve Saint-Laurent * déc 1977 * 148p

Ce dossier, très élaboré, présente le cadre d'élaboration de deux autres dossiers de même nature, soit le dossier des contaminants bactériologiques et celui des éléments nutritifs présents dans le fleuve Saint-Laurent. Il constitue, à ce titre, un "dossier type" encadrant trois dossiers d'actions nécessaires pour assurer la qualité de l'eau du fleuve Saint-Laurent.

589 (F14559)
DELISLE, A.; DESCOTEAUX, Y.; DENIS, M. * ***Le fleuve Saint-Laurent et la contamination bactériologique : annexe no 10*** * Comité d'étude sur le fleuve Saint-Laurent * févr 1978 * 135p

Ce rapport tente de cerner la réalité de la contamination bactériologique dans le fleuve Saint-Laurent, ses sources, sa nature, ses effets, les endroits les plus affectés, le cadre normatif, ainsi que les intervenants susceptibles de la contrôler. On y élabore aussi certains moyens d'action devant s'inscrire dans la perspective d'efficacité précédemment décrite.

590 (F14560)
DELISLE, A.; DESCOTEAUX, Y.; DENIS, M. * ***Le fleuve Saint-Laurent et l'empiètement : annexe no 11*** * Comité d'étude sur le fleuve Saint-Laurent * déc 1977 * 102p

Ce rapport décrit les intervenants, les organismes et les mécanismes d'intervention relatifs au problème des empiètements dans le fleuve Saint-Laurent. On y présente aussi les actions à entreprendre.

591 (F14561)
DELISLE, A.; DESCOTEAUX, Y.; DENIS, M. * ***Le fleuve Saint-Laurent et l'esthétique : annexe no 12*** * Comité d'étude sur le fleuve Saint-Laurent * déc 1977 * 88p

Il y a trois qualités fondamentales relatives à l'esthétique d'un paysage: la diversité, l'unicité et la vivacité. Ce rapport décrit les actions possibles dans le domaine de la conservation de la valeur esthétique du fleuve Saint-Laurent. Ces actions peuvent être de nature préventive ou corrective, de nature juridique ou sociale.

592 (F14562)
DELISLE, A.; DESCOTEAUX, Y.; DENIS, M. * ***Le fleuve Saint-Laurent et les sédiments en suspension : annexe no 13*** * Comité d'étude sur le fleuve Saint-Laurent * janv 1978 * 119p

Ce rapport traite du problème des sédiments en suspension dans le fleuve Saint-Laurent. On y définit les termes principaux, on décrit les effets des sédiments et on identifie la nature et l'importance des sources. Les mécanismes de contrôle ainsi que leur évaluation sont présentés afin de dégager les interventions nécessaires pour conserver le plein usage du fleuve.

593 (F14563)
DELISLE, A.; DESCOTEAUX, Y.; DENIS, M. * ***Le fleuve Saint-Laurent et les matières nutritives : annexe no 14*** * Comité d'étude sur le fleuve Saint-Laurent * mars 1978 * 104p

Ce dossier constitue le dernier d'une série de documents sur la détérioration du fleuve Saint-Laurent, soit la dissémination des substances toxiques, l'empiètement sur le territoire des ressources biologiques, la destruction de la valeur esthétique, l'abondance des sédiments en suspension et l'enrichissement excessif en matières nutritives. On ne reprendra que de façon sommaire la démarche effectuée, pour s'arrêter plutôt à faire ressortir les aspects plus spécifiques du dossier, de même que certaines interventions n'ayant pu être introduites dans les autres dossiers. On y décrit la synthèse des actions en rapport avec le problème des substances nutritives.

Miscellaneous reports / Rapports divers

594 (F14588)
PAGÉ, Y.L.; TERREAULT, J.A. * ***Étude du fleuve St-Laurent : qualité des eaux, tronçon Cornwall-Varennes*** * In: Étude du fleuve Saint-Laurent, tronçon Cornwall-Varennes * Régie des eaux du Québec, Gouvernement du Québec; Ministère des Richesses naturelles, Gouvernement du Québec; Environnement Canada; Ministère des Transports, Gouvernement du Canada * 31 mars 1973 * 131p

Cette étude de la qualité des eaux du fleuve Saint-Laurent dans le tronçon Cornwall-Varennes a trois buts principaux: la connaissance de la qualité générale de l'eau du fleuve Saint-Laurent; la solution ou des éléments de solution aux différents problèmes de pollution; et la connaissance du phénomène de mélange et d'assimilation dans le système hydraulique. Pour respecter ces buts, les équipes du Service des relevés et

des laboratoires ont procédé à l'échantillonnage et à l'analyse de l'eau du Saint-Laurent à différents endroits, plus particulièrement dans les sections transversales, dans le chenal, dans les tributaires et dans les baies des lacs Saint-François et Saint-Louis. Les herbiers et le phytoplancton du lac Saint-François ont aussi fait l'objet d'une étude sommaire.

595 (F14526)
PAGÉ, Y.L.; BÉLAND, J.; DEMERS, R.; DUBÉ, J.H. * ***Étude de la qualité des eaux, fleuve Saint-Laurent, tronçon Cornwall-Varennes : rapport d'étape*** * In: Étude du fleuve Saint-Laurent, tronçon Cornwall-Varennes * Régie des eaux du Québec, Gouvernement du Québec; Ministère des Richesses naturelles, Gouvernement du Québec; Environnement Canada; Ministère des Transports, Gouvernement du Canada * 12 oct 1972 * 55p

Ce rapport concerne l'étude de la qualité des eaux du fleuve Saint-Laurent entre Cornwall et Varennes. Afin de rencontrer les objectifs de l'étude, la Régie des eaux s'était fixé trois buts principaux: la connaissance de la qualité générale de l'eau du fleuve Saint-Laurent; la solution ou des éléments de solution aux différents problèmes de pollution et la connaissance du phénomène de mélange et d'assimilation dans le système hydraulique. Pour respecter ces buts, les équipes du Service des relevés et des laboratoires ont procédé à l'échantillonnage et à l'analyse de l'eau du Saint-Laurent à différents endroits, et plus particulièrement dans les sections transversales, dans le chenal, dans les tributaires et dans les baies du lac Saint-François et du lac Saint-Louis; de plus, les herbiers et le phytoplancton du lac Saint-François ont fait l'objet d'une étude sommaire.

596 (F14595)
BÉLAND, J.; DALLAIRE, L.; LONGPRÉ, G. * ***Étude de la qualité des eaux, fleuve Saint-Laurent, tronçon Cornwall-Varennes : répertoire des résultats d'analyses*** * In: Étude du fleuve Saint-Laurent, tronçon Cornwall-Varennes * Régie des eaux du Québec, Gouvernement du Québec; Ministère des Richesses naturelles, Gouvernement du Québec; Environnement Canada; Ministère des Transports, Gouvernement du Canada * 31 janv 1973 * 50p

Dans ce document, on retrouve les résultats des analyses physico-chimiques et bactériologiques, obtenus lors de l'étude de la qualité des eaux du fleuve Saint-Laurent. Ces résultats ont été compilés et mis en mémoire par un ordinateur du Centre de traitement électronique des données du Gouvernement du Québec.

597 (F14513)
SURVEYER, NENNIGER & CHÊNEVERT INC.; CARRIER, TROTTIER, AUBIN * ***Modèles mathématiques de simulation hydrodynamique et de la qualité des eaux*** * In: Étude du fleuve Saint-Laurent, tronçon Cornwall-Montmagny * Services de protection de l'environnement, Gouvernement du Québec; Ministère des Richesses naturelles, Gouvernement du Québec; Environnement Canada; Ministère des Transports, Gouvernement du Canada * 31 mars 1974 * pd

Ce rapport d'études comprend principalement la vérification des modèles mathématiques de simulations hydrodynamiques et de qualité des eaux du fleuve Saint-Laurent dans le tronçon Cornwall-Montmagny. On présente aussi le développement d'un modèle mathématique pour l'étude de paramètres de la qualité des eaux, de même que certaines simulations de solutions possibles pour le traitement des eaux usées de la région de Montréal.

598 (F14514)
SURVEYER, NENNIGER & CHÊNEVERT INC.; CARRIER, TROTTIER, AUBIN * ***Modèles mathématiques de simulation hydrodynamique et de la qualité des eaux : annexe B, Guide de traitement des données*** * In: Étude du fleuve Saint-Laurent, tronçon Cornwall-Montmagny * Services de protection de l'environnement, Gouvernement du Québec; Ministère des Richesses naturelles, Gouvernement du Québec; Environnement Canada; Ministère des Transports, Gouvernement du Canada * 31 mars 1974 * pd

Dans ce volume, l'annexe B-1 décrit les modèles hydrodynamiques et de qualité des eaux, l'annexe B-2 donne le programme pour les tracés, et l'annexe B-3 traite de la représentation par un système de coordonnées à partir de cartes hydrographiques..

599 (082272)
SURVEYER, NENNIGER & CHÊNEVERT INC.; CARRIER, TROTTIER, AUBIN; HYDROSCIENCE INC. * ***Study of Saint-Lawrence River, Cornwall-Varennes section : hydrodynamic and water quality simulation model*** * Environment Canada; Ministry of Transport, Government of Canada; Quebec Water Board; Quebec Department of Natural Resources * 31 Mar 1973 * vp

This report is a documentation of the application and further development of the Massachussetts Institute of Technology (MIT) transient hydrodynamic and water quality network model to the St Lawrence River from Cornwall to Varennes. The MIT model consists of a numerical solution of the hydrodynamic and mass transport equations which define the unsteady, non-uniform flow and the distribution of water quality parameters in rivers and estuaries. Geometric characteristics and boundary conditions are discussed and details of the schematization of the St Lawrence River, Rivière des Prairies and Rivière des Mille Îles are presented. The hydrodynamic portion of the model is verified by determining a roughness coefficient (Manning's n) which reproduces the observed water surface elevations along the St Lawrence River. Four water quality constituents, salinity, temperature, biochemical oxygen demand, and dissolved oxygen, are included in the mathematical model. The ability of the model to predict water quality levels is demonstrated by continuously injecting a conservative substance in the St Lawrence River near Cornwall and tracing the concentration front downstream. It is concluded that the

transient hydrodynamic and water quality network is capable of predicting the effect of natural and man-made changes in the regime of the St Lawrence River.

600 **(082273)**
SURVEYER, NENNIGER & CHÊNEVERT INC.; CARRIER, TROTTIER, AUBIN * ***Study of the St Lawrence River, Cornwall to Montmagny : hydrodynamic and water quality simulation models : appendix B, User's manual for the computer programs*** * Quebec Environmental Protection Services; Quebec Ministry of Natural Resources; Environment Canada; Ministry of Transport of Canada * 31 Mar 1974 * vp

This appendix is a user's guide of the computer program accompanying the main report on hydrodynamic and water quality models as applied to the St Lawrence River from Cornwall to Montmagny. The plotting program and a description of a coordinated system of schematization using hydrographic charts form part of the appendix. Data cards are divided into nine card groups: solution options, time parameters, and network topology; hydraulic description of the reaches; water quality description of the reaches; lateral inflow data; injection data; hydraulic boundary conditions at the nodes; hydraulic output parameters; water quality boundary conditions at the nodes; and water quality output parameters. It is possible to compute the hydraulics of an estuary once for a given tide, store the results, and reuse them several times to study alternate outfall locations for pollutant injection. A steady-state option is provided to avoid redundant data input of the card groups after the first period. A river or estuary option avoids unnecessary computation in achieving a steady-state initial conditions in a river network.

601 **(F14597)**
ADAMCYK, R.J.; PARENT, M. * ***Éléments hydrologiques et régularisation*** * In: Étude du fleuve Saint-Laurent, tronçon Cornwall-Varennes * Régie des eaux du Québec, Gouvernement du Québec; Ministère des Richesses naturelles, Gouvernement du Québec; Environnement Canada; Ministère des Transports, Gouvernement du Canada * janv 1973 * pd

Cette étude traite du débit et des niveaux d'eau dans la région de l'Île de Montréal, particulièrement sur le lac des Deux Montagnes et le lac Saint-Louis. Étant donné que ces niveaux résultent des débits du fleuve Saint-Laurent et de la rivière des Outaouais, l'étude fut basée sur les analyses suivantes: débits de la rivière des Outaouais à Grenville; débit du fleuve Saint-Laurent à la sortie du lac Ontario; niveaux du lac des Deux Montagnes et du lac Saint-Louis. Une analyse statistique fut effectuée. Un sommaire des résultats pour une période de récurrence de 50 ans des extrêmes mensuels est présenté.

602 **(082277)**
T.W. BEAK CONSULTANTS LIMITED * ***Biological survey of the St-Lawrence River 1972 : volume 1*** * Environnement Canada, Ministère des Transports; Régie des eaux du Québec, Ministère des Richesses naturelles * May 1973 * vii, 44p

This report presents the principal findings of the study conducted on the water quality of the St Lawrence River between Montreal and Lac St-Pierre. Analyses were conducted on benthic communities, water chemistry, sediment chemistry, fecal coliform and streptococcus bacteria, rooted aquatic plants and attached algal growth. To facilitate the presentation and interpretation of data, the study area was divided into five major water masses differentiated by chemical characterization and water flow. The report concludes that the water quality parameters warranting reduction to establish quality compatible with future user requirements are nutrients (nitrogen and phosphorus), organics, fecal bacteria and some toxic substances. Industrial and municipal treatment facilities should be designed for suspended solids and nutrient removal followed by chlorinated (for municipal). Follow-up studies are recommended to accurately establish the extent of localized environmental degradation detected in the vicinity of Montreal-Nord, Montreal-Est, and Montreal Harbour.

603 **(082252)**
T.W. BEAK CONSULTANTS LIMITED * ***Biological survey of the St. Lawrence River 1972 : volume 2*** * T.W. Beak Consultants Limited, Montreal, Que * Aug 1973 * vp

The Montreal Urban Community is planning the construction of sewage treatment facilities to serve Montreal Island. The design criteria for these facilities will depend on the present quality of the receiving waters rather than on effluent discharge standards. This report investigates water quality in the vicinity of Montreal and downstream on the St Lawrence River to Lac St-Pierre. Analyses are conducted of bottom sediment (benthic) invertebrate animal communities, water chemistry, sediment chemistry, fecal coliform and streptococcus bacteria, rooted aquatic plants, and attached algal growths. Volume 1 contains the principal findings of the study together with relevant supportive data. This report, Volume 2, includes detailed biological analyses and analyses of rooted aquatic plants and attached algae.

604 **(F14515)**
W.J. COSGROVE & ASSOCIÉS INC. * ***Caractéristiques de dispersion & dilution en aval de la rivière Châteauguay (rive sud)*** * In: Étude du fleuve Saint-Laurent, tronçon Cornwall-Varennes * Régie des eaux du Québec, Gouvernement du Québec; Ministère des Richesses naturelles, Gouvernement du Québec; Environnement Canada; Ministère des Transports, Gouvernement du Canada * 31 mars 1973 * pd

Ce rapport est une étude du rejet dans le lac Saint-Louis de l'effluent d'un futur émissaire envisagé dans le cadre de la préparation du plan directeur d'égout de la région de Châteauguay-Mercier. Il fallait en effet localiser l'émissaire dans une région d'eau courante où les facteurs hydrauliques et topographiques assureraient

une dispersion et une dilution adéquates de l'eau épurée, de manière à conserver à cette eau une qualité acceptable et protéger ainsi les intérêts des riverains. L'étude de dispersion et de dilution elle-même a été effectuée à l'aide de colorants et de photographies aériennes.

605 **(F14590)**
PAGÉ, Y.L.; CAILLE, A. • ***Étude de la qualité des eaux : rivière des Prairies, rivière des Mille Îles, lac des Deux Montagnes*** • Régie des eaux du Québec, Gouvernement du Québec • 1972 • 152p

Le lac des Deux Montagnes, la rivière des Prairies et la rivière des Mille Îles se situent à proximité de la région la plus développée du Québec. Cette étude vise à évaluer l'importance relative de la pollution apportée par la rivière des Outaouais par rapport à la pollution locale. Une partie importante de l'étude a été consacrée à l'analyse des problèmes se développant dans les baies. Cet effort particulier vise à élucider les problèmes que rencontrent les populations riveraines et à imposer les correctifs jugés nécessaires et réalisables selon les principes d'aménagement à court terme.

606 **(F14528)**
PAGÉ, Y.L.; CAILLE, A. • ***Étude de la qualité des eaux, rivière des Prairies, rivière des Mille Îles, lac des Deux Montagnes*** • Régie des eaux du Québec • 1972 • 38p

Le lac des Deux Montagnes, la rivière des Prairies et la rivière des Mille Îles se situent à proximité de la région la plus développée du Québec. Les problèmes causés par l'usage compétitif de l'eau y sont apparus depuis déjà plusieurs années. L'apport en eau provient principalement de la rivière des Outaouais et de la rivière du Nord. Ces rivières supportent des activités industrielles axées sur l'exploitation des forêts et des dépôts minéralogiques. La qualité de l'eau à l'entrée de la région à l'étude laissant déjà à désirer, cela rend encore plus graves les problèmes d'assimilation des eaux usées locales. On constatera qu'une partie importante de l'étude a été consacrée à l'analyse des problèmes se développant dans les baies entourant le lac; cet effort particulier vise à élucider les problèmes que rencontrent les populations riveraines et à imposer, dans les plus brefs délais, les correctifs jugés nécessaires et réalisables selon des principes d'aménagement à court terme.

607 **(F14524)**
CAILLE, A.; CAMPBELL, P.G.; MEYBECK, M.; SASSEVILLE, J.L. • ***Étude du fleuve Saint-Laurent: effluents urbains*** • In: Étude du fleuve Saint-Laurent, tronçon Cornwall-Varennes • Régie des eaux du Québec, Gouvernement du Québec; Ministère des Richesses naturelles, Gouvernement du Québec; Environnement Canada; Ministère des Transports, Gouvernement du Canada • 31 mars 1973 • 203p

Le programme d'étude dont les résultats sont rapportés visait à identifier les problèmes que peut engendrer le déversement d'eaux résiduaires dans le fleuve Saint-Laurent entre Coteau-Landing et Varennes. Cinquante bassins de drainage artificiels ont été choisis dans cette région. On présente les résultats de ces travaux en tentant de développer une perspective de l'impact possible des sources de pollution dans le milieu étudié. On décrit l'utilisation des territoires concernés; on caractérise la qualité chimique des différents émissaires; on estime le potentiel d'impact de ces sources sur le fleuve; et enfin, on classe ces sources en ordre d'importance, les unes par rapport aux autres.

608 **(F14525)**
CAILLE, A.; CAMPBELL, P.G.; CLUIS, D.; COUILLARD, D.; PEDNEAULT, M.; POTVIN, L.; ROUSSEAU, A.; SASSEVILLE, J.L.; TESSIER, A. • ***Étude du fleuve Saint-Laurent (tronçon Cornwall-Varennes) : synthèse des études 1972-73*** • In: Étude du fleuve Saint-Laurent, tronçon Cornwall-Varennes • Services de protection de l'environnement, Gouvernement du Québec; Ministère des Richesses naturelles, Gouvernement du Québec; Environnement Canada; Ministère des Transports, Gouvernement du Québec • mars 1974 • pd

Le 15 mai 1972, les gouvernements du Québec et du Canada décidaient de réaliser un programme quinquennal dont l'objectif était de développer les connaissances sur le fleuve Saint-Laurent. Ce rapport présente une première synthèse des résultats obtenus à ce jour. On décrit l'utilisation du territoire et les caractéristiques physiques du milieu, la qualité du milieu, les caractéristiques biologiques du milieu ainsi que le potentiel du milieu et les perspectives d'aménagement.

609 **(F14591)**
GROUPE DE TRAVAIL CANADA-QUÉBEC SUR LE FLEUVE SAINT-LAURENT • ***Étude du fleuve Saint-Laurent : rapport de l'année financière 1972-1973*** = Study of the St. Lawrence River : report for the fiscal year 1972-1973 • Environnement Canada, Ministère des Transports; Gouvernement du Québec, Régie des Eaux, Ministère des Richesses naturelles • mars 1973 • iv, 16p

Le 15 mai 1972, une déclaration d'intention a été signée, mettant de l'avant le programme 1972-1973 de gestion des eaux sur le Saint-Laurent en attendant la conclusion d'un accord officiel. Ce programme a par la suite été changé pour un programme de la gestion de la qualité de l'eau. Ce rapport détaille les activités entreprises en 1972-1973 selon les termes de la déclaration d'intention. Il fait également une revue des travaux réalisés par d'autres organismes et décrit les nouveaux développements et les mécanismes d'étude des impacts impliqués. Malgré un départ tardif et un budget restreint, le groupe de travail a presque entièrement réalisé le programme qu'il s'était proposé pour l'année 1972-1973.

610 **(F14527)**
UNIVERSITÉ LAVAL, CENTRE DE RECHERCHES SUR L'EAU (CENTREAU) • ***Fleuve Saint-Laurent : aspects physiques et sédimentologiques entre Cornwall et Varennes*** • In: Étude du

fleuve Saint-Laurent, tronçon Cornwall-Varennes * Régie des eaux du Québec, Gouvernement du Québec; Ministère des Richesses naturelles, Gouvernement du Québec; Environnement Canada; Ministère des Transports, Gouvernement du Canada * mars 1973 * 138p

Ce rapport traite des différents aspects physiques reliés au comportement hydrodynamique du fleuve Saint-Laurent, des caractéristiques physico-chimiques des sédiments ainsi que de l'évolution des rives de ce cours d'eau, dans les limites du tronçon Cornwall-Varennes. On donne un aperçu général de l'étude, on discute de l'évolution et de la morphologie des berges, on décrit l'étude des paramètres hydrauliques, l'étude du régime thermique, l'étude sommaire de la diffusion, le régime et l'analyse qualitative des sédiments, et on donne un aperçu de la limnologie des lacs Saint-François, Saint-Louis et des Deux Montagnes. Si l'on considère la dimension du fleuve dans cette région et la régularisation du débit, on peut conclure que l'évolution des rives est davantage influencée par les activités humaines que par des facteurs naturels.

611 (F14585)
UNIVERSITÉ LAVAL, CENTRE DE RECHERCHES SUR L'EAU (CENTREAU) * ***Fleuve Saint-Laurent : aspects physiques et sédimentologiques entre Cornwall et Varennes : annexes I à V*** * In: Étude du fleuve Saint-Laurent, tronçon Cornwall-Varennes * mars 1973 * pd

Ce document regroupe cinq annexes portant sur les aspects physiques et sédimentologiques du fleuve Saint-Laurent entre Cornwall et Varennes. L'annexe I correspond à la position des sections de mesures, des stations de mesures permanentes et des barrages; l'annexe II regroupe les études des rives du fleuve; l'annexe III donne les débits des stations et du transport de sédiments, les distributions transversales et verticales des vitesses et concentrations, ainsi que les tableaux des bilans hydrauliques; l'annexe IV présente la température des eaux du Saint-Laurent à diverses stations pour la période de 1960 à 1970; et enfin, l'annexe V traite du mélange des eaux de la rivière des Outaouais et du fleuve Saint-Laurent.

612 (F14530)
UNIVERSITÉ LAVAL, CENTRE DE RECHERCHES SUR L'EAU (CENTREAU) * ***Fleuve Saint-Laurent : aspects physiques et sédimentologiques entre Cornwall et Varennes : annexes VI et VII*** * In: Étude du fleuve Saint-Laurent, tronçon Cornwall-Varennes * mars 1973 * pd

Ce document contient les résultats d'une étude morphologique et sédimentologique du fleuve Saint-Laurent entre Cornwall et Varennes. L'annexe VI contient des cartes, des figures et des tableaux; l'annexe VII décrit les résultats de l'analyse chimique sous forme de cartes et de tableaux.

613 (F14522)
LALONDE, VALOIS, LAMARRE, VALOIS & ASSOCIÉS * ***Inventaire des équipements en eau : volume 1 : territoire de la Communauté urbaine de Montréal*** * In: Étude du fleuve Saint-Laurent, tronçon Cornwall-Varennes * Régie des eaux du Québec, Gouvernement du Québec; Ministère des Richesses naturelles, Gouvernement du Québec; Environnement Canada; Ministère des Transports, Gouvernement du Canada * mars 1973 * 370p

Ce volume contient l'inventaire des équipements en eau du territoire de la Communauté urbaine de Montréal. À l'appendice 1, on retrouve la liste des industries principales, obtenue à partir de données recueillies sur les compteurs et traitées par ordinateur pour l'étude de la consommation en eau de la Communauté urbaine de Montréal.

614 (F14523)
LALONDE, VALOIS, LAMARRE, VALOIS & ASSOCIÉS * ***Inventaire des équipements en eau : volume 2 : territoire de la rive sud de la région de Montréal*** * In: Étude du fleuve Saint-Laurent, tronçon Cornwall-Varennes * Régie des eaux du Québec, Gouvernement du Québec; Ministère des Richesses naturelles, Gouvernement du Québec; Environnement Canada; Ministère des Transports, Gouvernement du Canada * mars 1973 * pd

Dans le cadre de l'étude sur le fleuve Saint-Laurent entreprise conjointement par les gouvernements du Canada et du Québec, le Bureau d'études recevait pour mandat de procéder à l'inventaire des équipements en eau des municipalités du territoire de la Communauté urbaine de Montréal ainsi que de certaines municipalités de la rive sud. Le volume 1 contient les inventaires des municipalités du territoire de la Communauté urbaine de Montréal, et le volume 2, ceux des municipalités de la rive sud. Il a fallu remplir les questionnaires généraux et les questionnaires sur les usines de filtration et d'épuration, puis préparer un plan d'ensemble des réseaux d'aqueduc et d'égout.

615 (082274)
KUDRNAC, I. * ***Continuous water quality survey of the St Lawrence River : part I*** * Environmental Research Associates, Lachine, Que; Environmental Resarch Associates, Mississauga, Ont * nd * vp

The water quality survey of the St Lawrence River between the International Bridge at Cornwall and the eastern end of Île d'Orléans described in this report was started July 5, 1972, and completed July 24, 1972. The survey followed two tracks: Track A along the south shore of the river and Track B along the north shore. A general location chart shows the relation and position of each master chart and its number. Two independent analytical methods are used in the survey: continuous monitoring using ion selective electrodes and other electrometric or photometric instruments; and conventional laboratory methods. The concentration of cyanides throughout the survey was found below 5 ppb. During this survey, it was noted that the water quality at points where the St Lawrence River meets major tributaries changed very abruptly. Mixing and diffusion patterns could be accurately determined if speed is considerably reduced. It is imperative that

similar surveys be carried out at different water levels and during different seasons to determine a definite pattern in water contamination and self-purification of the river.

616 (082275)
KUDRNAC, I.K. * ***Results of continuous water quality survey of 3 sections of the St Lawrence River, May 19th - 23rd, 1973*** * Environmental Research Associates, Lachine, Que; Environmental Research Associates, Mississauga, Ont * 1973? * 54p

This continuous water quality survey of three sections (Lanoraie, Sorel West and Sorel East) of the St Lawrence River calibrates results between actual on-site water quality analysis with remote sensing techniques. For the on-site analysis, the water quality survey vessel Korab was used. For remote sensing, an aircraft operated by the Canadian Centre for Remote Sensing was used. Continuous water quality measurement was made of conductivity, temperature, pH, dissolved oxygen, color, turbidity, chlorides, ammonia, nitrates, o-phosphates, hardness, and chemical oxygen demand. Results indicate several rapid variations in different parameters. It appears that the river flows in a rather laminar flow and that the mixing of tributaries as well as of discharged matter is very slow up to the sections that were examined.

617 (082319)
KUDRNAC, I.K. * ***Results of continuous water quality survey of 3 sections of the St Lawrence River : October 12-18, 1973*** = Étude de la qualité de l'eau de 3 sections du fleuve St-Laurent par analyse continuelle : octobre 12-18, 1973 * Environmental Research Associates, Division of Korab Marine, Lachine, Que * 1973? * vp, 54p

This third survey of three cross sections of the St Lawrence River at Lanoraie, Sorel West and Sorel East, is a continuation of the program correlating water quality measurements by remote sensing techniques with on-site measurements. Results are presented for the following water quality parameters: conductivity, pH, temperature, dissolved oxygen, colour, turbidity, phosphates, nitrates, ammonia, chlorides, hardness, chemical oxygen demand at each location. Depth profiles are also included. The influence of weather conditions on water quality was demonstated during this survey; the effect of wind on dissolved oxygen, temperature, color, turbidity and other parametres was clearly visible and the overall water quality became more uniform. The influence of the Richelieu River was less pronounced during this survey, attributable to the much lower flow following a dry fall season. On October 13, a kerosene slick in the Sorel area was investigated; the apparent source (46°02′32″N, 73°08′54″W) was an underwater discharge pipe upstream of the wharf at St-Joseph-de-Tracy. The discharge diminished after 17:00 hr, October 13 and was not found on October 18.

618 (F14606)
KUDRNAC, I.K. * ***Étude de la qualité de l'eau de 3 sections du fleuve Saint-Laurent par analyse continuelle*** * oct 1973 * 54p

Ce rapport constitue la troisième étude de trois sections du fleuve Saint-Laurent. Il est la continuation du programme de calibration des résultats, entre les analyses actuelles de la qualité de l'eau, et celles d'une technique de détection à distance. Des analyses ont été effectuées pour déterminer les paramètres suivants: conductivité, pH, oxygène dissous, température, couleur, turbidité, o-phosphate, nitrate, amonia, chlorure et dureté. Les résultats de ces analyses sont présentés sous forme de graphiques et de tableaux qui composent presque entièrement ce rapport.

619 (082318)
KUDRNAC, I.K.; JANACEK, J.J.; FRAZER, G.; ROCH, G.; KARIM, A. * ***Continuous water quality survey of the St Lawrence River : July, September 1972 : section: Cornwall-Île d'Orléans*** = L'étude continuelle sur la qualité des eaux du fleuve St-Laurent : juillet, septembre 1972 : tronçon: Cornwall-Île d'Orléans * Environment Canada; Department of Transport, Government of Canada; Régie des eaux du Québec; Ministère des Richesses naturelles du Québec * 1972? * vp

The water quality survey of the St Lawrence River described in this report was carried out in July and September 1972. It establishes the overall water quality of the river at a high flow level (July) and low flow level (September) and provides a basis for subsequent studies in more localized areas, of diffusion and assimilation of tributaries and of long-term water quality changes. The area under survey extended from the International Bridge in Cornwall to the eastern end of Île d'Orléans, a distance of 350 statute miles. On the downstream voyage, the south shore of the river was followed, and on the up-bound trip the north shore was followed. Several cross sections were examined in the lakes and in narrow parts of the river. Continuous water quality monitoring and recording were done throughout the voyage.(au)

620 (F14605)
KUDRNAC, I.K.; JANACEK, J.J.; FRAZER, G.; ROCH, G.; KARIM, A. * ***L'étude continuelle sur la qualité des eaux du fleuve St-Laurent : tronçon: Cornwall à l'Île d'Orléans*** * sept 1972 * pd

L'étude de la qualité de l'eau du fleuve Saint-Laurent décrite dans ce rapport, a été faite au cours des mois de juillet et septembre 1972. Elle établit la qualité générale de l'eau à un niveau élevé (juillet) et bas (septembre) et fournit une base pour des études plus approfondies dans des régions plus restreintes, sur la diffusion et l'assimilation des tributaires et sur les changements de la qualité de l'eau pendant une longue durée de temps. Plusieurs méthodes analytiques ont été employées au cours de cette étude. La première méthode consiste à pomper l'eau à travers une série de détecteurs électroniques, lesquels évaluent et

enregistrent les résultats sur un graphique continu. Les paramètres suivants sont déterminés par cette méthode: conductivité, pH, oxygène dissous, température, couleur, turbidité, o-phosphate, nitrate, amonia, chlorure et dureté. Ensuite, des méthodes analytiques standards ont été utilisées pour la détection des cyanures, des tannins et des lignines, pour la détermination de la demande chimique en oxygène et pour les analyses microbiologiques.

621 (F14531)
UNIVERSITÉ LAVAL, CENTRE DE RECHERCHES SUR L'EAU (CENTREAU) * ***Hydrologie du bassin du fleuve Saint-Laurent entre Varennes et Montmagny*** * In: Étude du fleuve Saint-Laurent, tronçon Varennes-Montmagny * Services de protection de l'environnement, Gouvernement du Québec; Ministère des Richesses naturelles, Gouvernement du Québec; Environnement Canada; Ministère des Transports, Gouvernement du Canada * mai 1974 * 145p

Ce document porte sur les caractéristiques des bassins entre Varennes et Montmagny et sur le comportement spatio-temporel des apports. Un modèle régional de prédiction des débits extrêmes est développé dans le but d'établir un projet d'aménagement optimum de la ressource eau en fonction des besoins et des disponibilités.

622 (F14532)
UNIVERSITÉ LAVAL, CENTRE DE RECHERCHES SUR L'EAU (CENTREAU) * ***Hydrologie du bassin : annexe A*** * In: Étude du fleuve Saint-Laurent, tronçon Varennes-Montmagny * Services de protection de l'environnement, Gouvernement du Québec; Ministère des Richesses naturelles, Gouvernement du Québec; Environnement Canada; Ministère des Transports, Gouvernement du Canada * mars 1974 * pd

Cette annexe contient les cartes des limites du bassin versant drainé par les affluents nord et sud du Saint-Laurent entre Varennes et Montmagny. On y retrouve aussi des tableaux et des figures décrivant les stations hydrométriques, la période d'enregistrement et le type d'opération des stations hydrométriques.

623 (F14533)
UNIVERSITÉ LAVAL, CENTRE DE RECHERCHES SUR L'EAU (CENTREAU) * ***Hydrologie du bassin : annexe B*** * In: Étude du fleuve Saint-Laurent, tronçon Varennes-Montmagny * Services de protection de l'environnement, Gouvernement du Québec; Ministère des Richesses naturelles, Gouvernement du Québec; Environnement Canada; Ministère des Transports, Gouvernement du Canada * mars 1974 * pd

Cette annexe contient des cartes, des tableaux et des figures sur les données météorologiques du fleuve Saint-Laurent entre Varennes et Montmagny.

624 (F14589)
UNIVERSITÉ LAVAL, CENTRE DE RECHERCHES SUR L'EAU (CENTREAU); CONSORTIUM DE LA RECHERCHE SUR L'EAU * ***Fleuve Saint-Laurent : aspects physiques et sédimentologiques entre Varennes et Montmagny*** * In: Étude du fleuve Saint-Laurent, tronçon Varennes-Montmagny * Services de protection de l'environnement, Gouvernement du Québec; Ministère des Richesses naturelles, Gouvernement du Québec; Environnement Canada; Ministère des Transports, Gouvernement du Canada * mars 1974 * 266p

Ce document traite des aspects physiques et sédimentologiques du fleuve Saint-Laurent, dans les limites du tronçon Varennes-Montmagny. Le but principal de l'étude était de découvrir l'importance des sédiments de fond sur l'évolution des polluants et l'équilibre du milieu aquatique. Afin d'atteindre cet objectif, on a effectué des recherches physiques et sédimentologiques, ainsi que différentes analyses. Dans ce rapport, on retrouve les résultats et quelques conclusions.

625 (F14519)
UNIVERSITÉ LAVAL, CENTRE DE RECHERCHES SUR L'EAU (CENTREAU) * ***Aspects physiques et sédimentologiques entre Varennes et Montmagny : tome II, annexe A*** * In: Étude du fleuve Saint-Laurent, tronçon Varennes-Montmagny * Services de protection de l'environnement, Gouvernement du Québec; Ministère des Richesses naturelles, Gouvernement du Québec; Environnement Canada; Ministère des Transports, Gouvernement du Canada * mars 1974 * pd

Cette annexe contient huit cartes sur les aspects physiques et sédimentologiques du fleuve Saint-Laurent entre Varennes et Montmagny.

626 (F14520)
UNIVERSITÉ LAVAL, CENTRE DE RECHERCHES SUR L'EAU (CENTREAU) * ***Aspects physiques et sédimentologiques entre Varennes et Montmagny : tome III, annexe B*** * In: Étude du fleuve Saint-Laurent, tronçon Varennes-Montmagny * Services de protection de l'environnement, Gouvernement du Québec; Ministère des Richesses naturelles, Gouvernement du Québec; Environnement Canada; Ministère des Transports, Gouvernement du Canada * mars 1974 * pd

Cette annexe présente les aspects physiques et sédimentologiques du fleuve Saint-Laurent entre Varennes et Montmagny. On y trouve les résultats de l'étude ainsi que des analyses granulométriques.

627 (F14518)
LALONDE, VALOIS, LAMARRE, VALOIS & ASSOCIÉS INC. * ***Inventaire des équipements en eau et relevés industriels, volume I : municipalités de Cornwall à Montréal (excluant la CUM)*** * In: Étude du fleuve Saint-Laurent, tronçon Cornwall-Montmagny * Services de protection de l'environnement, Gouvernement du Québec; Ministère des

Richesses naturelles, Gouvernement du Québec; Environnement Canada; Ministère des Transports, Gouvernement du Canada * mars 1974 * 2v

Ce rapport est un inventaire des équipements en eau des municipalités riveraines du Saint-Laurent comprises dans le tronçon Cornwall-Montmagny. L'inventaire a consisté à remplir des questionnaires sur les équipements en eau, les usines de filtration, les postes d'épuration et les industries principales, puis à préparer des plans généraux d'aqueduc et d'égout. Ce volume contient les questionnaires, les plans généraux d'aqueduc et d'égouts et la liste des industries principales.

628 (F14512)
LALONDE, VALOIS, LAMARRE, VALOIS & ASSOCIÉS INC. * ***Inventaire des équipements en eau et relevés industriels, volume II : municipalités de Varennes à Trois-Rivières*** * In: Étude du fleuve Saint-Laurent, tronçon Cornwall-Montmagny * Services de protection de l'environnement, Gouvernement du Québec; Ministère des Richesses naturelles, Gouvernement du Québec; Environnement Canada; Ministère des Transports, Gouvernement du Canada * mars 1974 * 2v

Ce rapport est un inventaire des équipements en eau des municipalités riveraines du Saint-Laurent comprises dans le tronçon Cornwall-Montmagny. L'inventaire a consisté à remplir des questionnaires sur les équipements en eau, les usines de filtration, les postes d'épuration et les industries principales, puis à préparer des plans généraux d'aqueduc et d'égout. Sur les plans intitulés Conduites d'aqueduc principales, on retrouve le diamètre des conduites principales, les usines de filtration, les prises d'eau, les stations de pompage, les réservoirs, les postes de réduction de pression, les postes de chloration, et dans certains cas, les chambres de compteurs. Les plans Conduites d'égout principales montrent l'emplacement et les diamètres des conduites principales, le sens d'écoulement dans les cas où ils étaient indiqués sur les plans obtenus, les postes d'épuration, les stations de pompage, les postes de chloration, les étangs d'oxydation et les émissaires.

629 (F14510)
LALONDE, VALOIS, LAMARRE, VALOIS & ASSOCIÉS INC. * ***Inventaire des équipements en eau et relevés industriels, volume III: municipalités de Bécancour à Montmagny*** * In: Étude du fleuve Saint-Laurent, tronçon Cornwall-Montmagny * Services de protection de l'environnement, Gouvernement du Québec; Ministère des Richesses naturelles, Gouvernement du Québec; Environnement Canada; Ministère des Transports, Gouvernement du Canada * mars 1974 * pd

Ce volume contient les résultats des questionnaires sur les équipements en eau, les usines de filtration, les postes d'épuration et les principales industries de douze municipalités, de Bécancour à Montmagny, à l'exception de la Communauté urbaine de Québec.

630 (F14511)
LALONDE, VALOIS, LAMARRE, VALOIS & ASSOCIÉS INC. * ***Inventaire des équipements en eau et relevés industriels, volume IV: plans des conduites principales d'aqueduc et d'égout de la Communauté urbaine de Québec*** * In: Étude du fleuve Saint-Laurent, tronçon Cornwall-Montmagny * Services de protection de l'environnement, Gouvernement du Québec; Ministère des Richesses naturelles, Gouvernement du Québec; Environnement Canada; Ministère des Transports, Gouvernement du Canada * mars 1974 * 2v

Ce volume contient les plans des conduites principales d'aqueduc et d'égout de la Communauté urbaine de Québec, ainsi que la liste des principales industries indiquées sur le plan général d'égout.

631 (F14548)
LABORATOIRE DE GÉNIE SANITAIRE DU QUÉBEC INC. * ***Effluents urbains*** * In: Étude du fleuve Saint-Laurent, tronçon Varennes-Montmagny * Environnement Canada, Ministère des Transports; Gouvernement du Québec, Services de protection de l'environnement, Ministère des Richesses naturelles * mars 1974 * xv, pd

Cette étude couvre les effluents urbains qui se déversent directement ou à proximité du fleuve Saint-Laurent dans le tronçon Varennes-Montmagny. Quinze émissaires d'égouts ont été échantillonnés. Des échantillons ont été prélevés toutes les 4 heures durant une période de 6 ou 7 jours. Les paramètres suivants ont été étudiés: débit, pH, solides totaux, en suspension, décantables et dissous, DBO5, DCO, huiles et graisses, chlorures, azote, nitrites et nitrates, phosphates, alcalinité, conductivité, cuivre, plomb, zinc et cadmium. Les bassins de drainage des émissaires étudiés ont été analysés en termes de population, de superficie et d'utilisation du territoire. Les résultats ont été interprétés de façon générale et par émissaire. Il existe des écarts importants entre les émissaires pour les apports per capita des charges de pollution. Plusieurs émissaires ont des solides décantables faibles qui pourraient affecter le rendement d'un décanteur primaire. Certains émissaires déversent des substances toxiques en concentration élevée et supérieure aux normes d'effluents.(au)

632 (F14529)
PIETTE, AUDY, BERTRAND, LEMIEUX, FUGÈRE, LEBLOND * ***Diffusion dans le fleuve St-Laurent des eaux usées de Sorel et de Trois-Rivières : rapport d'étude*** * In: Étude du fleuve Saint-Laurent * Services de protection de l'environnement, Gouvernement du Québec; Ministère des Richesses naturelles, Gouvernement du Québec; Environnement Canada; Ministère des Transports, Gouvernement du Canada * mars 1974 * 41p

Ce volume contient les résultats d'une étude de la diffusion des eaux usées des agglomérations de Sorel et de Trois-Rivières dans les eaux du fleuve Saint-Laurent. L'étude comporte: un inventaire des études

antérieures sur un plan directeur d'assainissement afin de connaître la localisation des émissaires, le projet d'épuration, le débit et la qualité des eaux usées; un relevé des caractéristiques du fleuve Saint-Laurent; un relevé de la qualité des eaux du fleuve Saint-Laurent; une étude de la diffusion proprement dite des eaux usées dans le Saint-Laurent considérant l'étalement des particules ou le cône de diffusion et le trajet suivi par les particules; et enfin, une discussion sur l'opportunité de la diffusion et la localisation d'un couloir de lancement propice à la diffusion.

633 (F14543)
KUDRNAC, I.K.; JANACEK, J.J.; FRAZER, G.; ROCH, G.; KARIM, A. • ***L'étude continuelle sur la qualité des eaux du fleuve St-Laurent*** = Continuous water quality survey of the St. Lawrence River • In: Étude du fleuve Saint-Laurent, tronçon Cornwall-Montmagny • Services de protection de l'environnement, Gouvernement du Québec; Ministère des Richesses naturelles, Gouvernement du Canada; Environnement Canada; Ministère des Transports, Gouvernement du Canada • 1974 • 51p

L'étude de la qualité de l'eau du fleuve Saint-Laurent décrite dans ce rapport a été effectuée au cours des mois de mai, juin et juillet 1973. Le tronçon étudié s'étend sur une distance de 350 milles soit entre le pont International à Cornwall jusqu'à l'extrémité est de l'île d'Orléans. Plusieurs sections transversales dans les lacs et dans les régions étroites du fleuve ont été étudiées en même temps. Plusieurs méthodes analytiques ont été employées au cours de cette étude: l'analyse continuelle, la demande chimique en oxygène, les analyses microbiologiques ainsi que les tannins et lignines.

634 (F14587)
KUDRNAC, I.K. • ***Étude de la qualité de l'eau de trois sections du fleuve St. Laurent par l'analyse continuelle (i.e. Saint-Laurent)*** • In: Étude du fleuve Saint-Laurent, tronçon Cornwall-Montmagny • Services de protection de l'environnement, Gouvernement du Québec; Ministère des Richesses naturelles, Gouvernement du Québec; Environnement Canada • 1973 • pd

Le but de cette analyse de la qualité de l'eau dans trois sections du fleuve Saint-Laurent était de comparer les résultats des analyses sur place et des analyses effectuées à l'aide d'une technique de détection à distance. Les trois sections à l'étude sont Lanoraie, Sorel Ouest et Sorel Est. Pour les analyses sur place, le navire-laboratoire Korab a été utilisé, tandis que pour la détection à distance on a utilisé un avion opéré par le Centre canadien pour la détection à distance. On a analysé la qualité de l'eau en mesurant les paramètres suivants: la conductivité, la température, le pH, l'oxygène dissous, la couleur, la turbidité, le chlorure, les nitrates et les phosphates. Les tableaux et les graphiques présentés dans ce rapport montrent les résultats obtenus.

635 (F14601)
BÉLAND, J.; PELLERIN, A. • ***Étude de la qualité des eaux, fleuve Saint-Laurent, tronçon Varennes-Montmagny*** • In: Étude du fleuve Saint-Laurent, tronçon Varennes-Montmagny • Services de protection de l'environnement, Gouvernement du Québec; Ministère des Richesses naturelles, Gouvernement du Québec; Environnement Canada; Ministère des Transports, Gouvernement du Canada • mars 1974 • 256p

L'étude de la qualité des eaux du fleuve Saint-Laurent fait partie intégrante d'un ensemble d'études entreprises dans le cadre du programme quinquennal établi par le groupe de travail Canada-Québec sur le fleuve Saint-Laurent. Les principaux objectifs visés par cette étude étaient: la connaissance de certains phénomènes d'assimilation dans le système hydraulique, principalement aux estuaires importants et aux zones tampons étudiées dans le tronçon; le suivi de l'évolution de la qualité de l'eau dans le temps afin de mieux définir les variations selon les saisons; la réalisation d'une étude complémentaire à ce qui avait antérieurement été effectué par d'autres organismes.

636 (F14549)
ÉCO-RECHERCHES LTÉE • ***Étude planctonique et benthique du fleuve Saint-Laurent (tronçon lac Saint-Pierre-Montmagny)*** • In: Étude du fleuve Saint-Laurent, tronçon Varennes-Montmagny • Environnement Canada, Ministère des Transports; Gouvernement du Québec, Services de protection de l'environnement, Ministère des Richesses naturelles • mars 1974 • 164p

Le groupe de travail Canada-Québec sur le fleuve Saint-Laurent a été constitué pour étudier la qualité de l'eau de ce fleuve et son degré d'eutrophisation. En 1973, le tronçon du fleuve entre le lac Saint-Pierre et Montmagny a fait l'objet d'une étude spéciale. L'étude biologique du tronçon repose principalement sur l'analyse de la macrofaune benthique ainsi que du phytoplancton. Quelques paramètres physico-chimiques, bactériologiques et sédimentologiques viennent compléter ces analyses biologiques. Dans ce rapport, on donne d'abord une description sommaire des stations d'échantillonnage, puis on précise la méthodologie utilisée. Dans une seconde partie, on donne et discute les résultats obtenus. Finalement, on apporte quelques conclusions sur l'étude effectuée ainsi que quelques suggestions quant aux études biologiques futures dans le fleuve Saint-Laurent.(au)

637 (F14580)
LEMAY, H.P. • ***Bibliographie sur le Saint-Laurent*** • In: Étude du fleuve Saint-Laurent • Environnement Canada, Ministère des Transports; Gouvernement du Québec, Services de protection de l'environnement, Ministère des Richesses naturelles • mars 1974 • iv, 159p

Ce document présente le relevé bibliographique de la documentation relative au fleuve Saint-Laurent. Il est divisé en six chapitres. Le premier chapitre rassemble la bibliographie des sources documentaires, le

second les études générales sur l'ensemble du bassin du Saint-Laurent. Le troisième chapitre porte sur les études des sections du fleuve (tronçon international, estuaire, golfe), tandis que le quatrième chapitre correspond aux études des principaux tributaires du Saint-Laurent au Québec. Le cinquième chapitre regroupe les études socio-économiques québécoises au niveau global, régional et local. Enfin, le dernier chapitre rassemble les autres études sur l'eau, notamment les problèmes juridiques, le traitement et la consommation, la géologie et la météorologie, ainsi que des exemples d'aménagement de cours d'eau.

638 (F14545)
UNIVERSITÉ LAVAL, CENTRE DE RECHERCHES SUR L'EAU (CENTREAU) * ***Étude de la qualité des sédiments et suspensions entre Québec et Trois-Pistoles (i.e. en suspension)*** * In: Étude du fleuve Saint-Laurent, tronçon Québec-Trois-Pistoles * Environnement Canada; Gouvernement du Québec, Services de protection de l'environnement, Ministère des Richesses naturelles * mars 1975 * xiv, 154p

Ce rapport présente une brève description des caractéristiques physiques et hydrodynamiques de l'estuaire du Saint-Laurent, visant à mettre en lumière les mécanismes de transport et d'accumulation de sédiments. Cette description est suivie d'un résumé de la nature et des caractéristiques de qualité des zones de dépôts du tronçon de l'estuaire du Saint-Laurent compris entre Québec et Trois-Pistoles. Des informations sur la qualité des matières en suspension, en regard de la circulation résiduelle dans l'estuaire, permettent d'expliquer en partie la provenance des polluants retrouvés dans les zones d'accumulation préférentielle. Enfin, de l'étude des matières en suspension par télédétection, on dégage certains renseignements sur l'évolution du bouchon de turbidité qui se forme entre l'île d'Orléans et l'île aux Coudres, ce phénomène ayant une grande importance non seulement sur les processus sédimentaires de l'estuaire mais aussi sur l'équilibre des biocénoses qui l'habitent.(au)

639 (F14582)
UNIVERSITÉ LAVAL, CENTRE DE RECHERCHES SUR L'EAU (CENTREAU) * ***Étude de la qualité des sédiments et suspensions entre Québec et Trois-Pistoles : section II : résultats des analyses et étude des corrélations (i.e. en suspension)*** * In: Étude du fleuve Saint-Laurent * Environnement Canada; Gouvernement du Québec, Services de protection de l'environnement, Ministère des Richesses naturelles * mars 1975 * pd

Ce document présente les tableaux des résultats des analyses effectuées sur 870 échantillons de sédiments de fond prélevés dans le fleuve Saint-Laurent entre Québec et Trois-Pistoles. On y trouve également les valeurs du coefficient de corrélation de Pearson pour ces échantillons. Les résultats comprennent six valeurs: les pourcentages d'argile, de limon, de sable et de particules inférieures à 74 microns; les pourcentages de matières volatiles dans les sédiments bruts et tamisés; et enfin, le pourcentage de matières humiques dans les sédiments.

640 (F14516)
LAPERLE, M.; LAMOUREUX, J.P. * ***Études biologiques : tome 1*** * In: Étude du fleuve Saint-Laurent * Services de protection de l'environnement, Gouvernement du Québec; Ministère des Richesses naturelles, Gouvernement du Québec; Environnement Canada * mars 1975 * 261p

L'entente Canada-Québec, dans le cadre de laquelle s'est effectué ce rapport, a pour but d'étudier le problème de la dégradation de la qualité des eaux du Saint-Laurent, d'en identifier les causes et de proposer les solutions. Ce premier volume réunit et résume les données relatives aux travaux biologiques effectués depuis 1950 sur le cours du fleuve Saint-Laurent, entre Cornwall et Trois-Pistoles. L'inventaire porte sur l'ensemble des sources suivantes: rapports internes des organismes publics de recherche et d'aménagement, publications scientifiques courantes, thèses non publiées des universités, documents privés ou commerciaux, communications personnelles ou données non colligées. À partir de la revue effectuée, le rapport décrit la qualité biologique actuelle du milieu en incluant une analyse générale du milieu, en identifiant certains organismes indicateurs du degré de pollution et en identifiant les facteurs hypothétiquement responsables du zonage des différents écosystèmes.

641 (F14517)
LAPERLE, M.; LAMOUREUX, J.P. * ***Études biologiques : tome 2, qualité et évolution du milieu*** * In: Étude du fleuve Saint-Laurent * Services de protection de l'environnement, Gouvernement du Québec; Ministère des Richesses naturelles, Gouvernement du Québec; Environnement Canada * mars 1975 * 106p

L'entente Canada-Québec sur le fleuve Saint-Laurent comprenait une revue bibliographique générale des travaux portant sur le Saint-Laurent, une analyse de l'évolution du milieu et une identification des facteurs hypothétiquement responsables de la zonation des différents écosystèmes inventoriés sur le fleuve. Cette analyse devrait aboutir à une description de la qualité biologique actuelle du fleuve Saint-Laurent et à une identification des organismes pouvant être considérés comme indicateurs du degré de pollution atteint. L'analyse de l'évolution et de la qualité biologique du Saint-Laurent, qui fait l'objet de ce volume, est basée sur les données pertinentes mises à jour pendant la revue bibliographique. On traite de la zonation biocénotique, de l'influence de l'homme sur les facteurs de zonation, de l'évolution et de la qualité biologique actuelle ainsi que des organismes indicateurs de la qualité du milieu.

642 (F14603)
CLUIS, D.; COUILLARD, D.; LAPOINTE, R.; POTVIN, L.; ROUSSEAU, A.; SASSEVILLE, J.L.; TESSIER, A. * ***Étude du fleuve Saint-Laurent, tronçon Varennes-Montmagny : synthèse des études***

1973-74 * Université du Québec, INRS-Eau * juil 1975 * 141p * (Rapport scientifique, no 48)

Ce rapport débute par une étude des aspects physiques et humains du bassin du fleuve Saint-Laurent entre Varennes et Montmagny. On y retrouve des données physico-chimiques de la qualité de l'eau du fleuve, des tributaires, de 50 émissaires d'égouts de la région de Montréal et de 15 émissaires d'égouts répartis dans les régions de Sorel, Trois-Rivières, Québec et Lévis. La qualité physico-chimique du fleuve ainsi que ses variations spatiales et temporelles sont expliquées à partir de ces données. On y aborde aussi, séparément, les aspects physiques, chimiques et biologiques des sédiments. Un tableau synoptique des observations des consultants et une esquisse d'utilisation comprenant une option d'aménagement terminent ce rapport.

643 (F14581)
UNIVERSITÉ DU QUÉBEC, INRS-EAU * ***Annexe cartographique 1974 - 1975*** * In: Étude du fleuve Saint-Laurent * Environnement Canada; Gouvernement du Québec, Services de protection de l'environnement, Ministère des Richesses naturelles * mars 1975 * pd

Ce document constitue une annexe cartographique à l'étude des aspects physiques, chimiques et biologiques du fleuve Saint-Laurent dans le tronçon Cornwall-Montmagny. Cette annexe cartographique regroupe 16 figures qui illustrent la morphométrie du lit et des berges, le régime hydrodynamique, la diffusion des eaux, l'utilisation de la ressource, le transport des sédiments en suspension, la nature des fonds, la distribution de la matière organique, des détergents et des substances traces, la caractérisation des sédiments, les zones de sédimentation, la capacité d'échange des sédiments, la classification des stations sédimentologiques et benthiques, l'influence de la rive sur les eaux riparienes et enfin, la répartition des apports théoriques en azote et phosphore.

644 (F14583)
PELLERIN, A. * ***Étude de la qualité des eaux : région Québec-Les Escoumins : tome 1*** * In: Étude du fleuve Saint-Laurent, tronçon Montréal-Les Escoumins * Environnement Canada; Gouvernement du Québec, Services de protection de l'environnement, Ministère des Ressources naturelles * mars 1975 * xiii, 210p

Ce rapport présente les résultats obtenus à la suite des travaux effectués dans le cadre de l'étude de la qualité des eaux salées du fleuve Saint-Laurent entre Québec et Les Escoumins. Les objectifs de l'étude sont les suivants: préciser l'impact des eaux douces sur les eaux salées, préciser l'influence de la marée sur la qualité des eaux dans ce tronçon du fleuve, préciser l'évolution de la qualité des eaux dans le temps, de l'amont à l'aval du tronçon et d'une rive à l'autre du fleuve, préciser l'impact des polluants des eaux douces sur les eaux salées, déterminer la qualité des eaux des rives et des îles, et enfin, comprendre les phénomènes de floculation et de transport en suspension des sédiments par les courants.

645 (F14584)
PELLERIN, A. * ***Étude de la qualité des eaux : région de Montréal : tome 2*** * In: Étude du fleuve Saint-Laurent, tronçon Montréal-Les Escoumins * Environnement Canada; Gouvernement du Québec, Services de protection de l'environnement, Ministère des Richesses naturelles * mars 1975 * vii, 126p

Ce rapport présente les résultats obtenus à la suite des travaux effectués dans le cadre de l'étude de la qualité des eaux douces du fleuve Saint-Laurent dans la région de Montréal et à l'embouchure des principaux tributaires. Les objectifs de l'étude sont les suivants: 1) améliorer la connaissance de la qualité des eaux des principaux affluents du Saint-Laurent et classifier ceux-ci en fonction de leur qualité; et 2) quantifier la charge de matières polluantes déversées en amont et en aval de Montréal afin de déterminer l'impact des eaux usées sur la qualité des eaux.

646 (F14617)
GRAVEL, Y.; LÉVESQUE, F.L. * ***Inventaire et cartographie des herbiers du fleuve Saint-Laurent*** * Ministère du Tourisme, de la Chasse et de la Pêche * juil 1978 * iii, 134p

Cet inventaire des herbiers du fleuve Saint-Laurent est le résultat de compilations bibliographiques, d'études phytosociologiques et phytogéographiques de carnets d'exploration de biologistes et également d'observations sur le terrain et par télédétection sur les plantes aquatiques et riparienes. Le territoire étudié comprend des données plus précises sur le lacs Saint-François et Saint-Louis, mais également sur les lacs Saint-Pierre, des Deux Montagnes, de même que les rivières des Prairies et des Mille Îles. On y regroupe des données sur les espèces dominantes et co-dominantes, le comportement des plantes, leur homogénéité, les conditions environnementales et diverses autres observations.

647 (F14619)
LEHOUX, D.; BOURGET, A. * ***Distribution et abondance des oiseaux migrateurs le long du St-Laurent (Cornwall-Rimouski)*** * Ministère de l'Environnement, Service canadien de la faune * mars 1976 * 11p

Une série d'inventaires détaillés sur les oiseaux aquatiques le long du Saint-Laurent (entre Cornwall et Rimouski) a été effectuée au printemps et à l'automne afin de déterminer l'abondance, la distribution et l'utilisation de cette région par la sauvagine durant les migrations. Pour faciliter l'interprétation des résultats, la région a été divisée en dix zones. Les résultats montrent qu'en général les concentrations sont plus importantes à l'automne qu'au printemps. Certaines espèces, comme les canards plongeurs, les oies et les canards de mer, se regroupent dans des zones spécifiques le long du fleuve. Il faut toutefois noter que ces résultats ne tiennent pas compte des possibilités de nidification dans les différentes zones, et qu'ils ne représentent qu'une seule année d'inventaires.

648 **(F14604)**
BOUCHARD, D.; ROBIDOUX, L.; OBRY, P. * ***Localisation des frayères des principales espèces de poissons d'intérêt sportif et commercial dans le fleuve Saint-Laurent (Phase I)*** * In: Colloque d'études sur le fleuve Saint-Laurent, Québec, mars 1976 * 1976? * 38p

Cette étude est un essai de localisation et de caractérisation des frayères dans le fleuve Saint-Laurent. L'étude des frayères des principales espèces de poissons comprend deux étapes ou deux phases. Ce document constitue la première phase. On y détermine les sites de fraie tout en délimitant le mieux possible l'aire de ces sites. L'ensemble des opérations effectuées pour arriver à la cartographie des sites de fraie est regroupé sous trois démarches. En premier lieu, une période d'échantillonnage a fourni des données sur un éventail de 140 stations. Une recherche bibliographique intensive suivit l'échantillonnage. Enfin, une interprétation systématique de toutes les données et informations recueillis a permis d'effectuer une cartographie des sites de fraie identifiés et potentiels.

649 **(F14608)**
ENVIRONNEMENT CANADA, SERVICE DE LA PROTECTION DE L'ENVIRONNEMENT * ***Le potentiel de fertilité : premier rapport annuel*** * In: Étude du fleuve Saint-Laurent * Environnement Canada, Service de la protection de l'environnement; Gouvernement du Québec, Services de protection de l'environnement * nov 1976 * iii, 43p

La qualité des eaux du bassin du fleuve Saint-Laurent est perçue à l'aide d'un bioessai (Selenastrum capricornutum). Quatre types de stations sont échantillonnées : les stations situées dans la voie maritime, sur les berges, sur les tributaires nord et sur les tributaires sud. Les niveaux d'enrichissement en substances nutritives disponibles sont établis, et le facteur chimique qui contrôle la production primaire est identifié. Des normes sont proposées et la qualité de l'eau des différentes stations est caractérisée. Enfin, une méthodologie est développée afin de mettre en évidence les stations affectées par la présence de substances toxiques.(au)

650 **(F14609)**
DIRECTION DE LA CONNAISSANCE DE LA QUALITÉ DU MILIEU (SPEQ); SERVICE DE LA QUALITÉ DES EAUX (MRN) * ***Production primaire*** * In: Étude du fleuve Saint-Laurent * Environnement Canada; Gouvernement du Québec * mars 1976 * pd

Ce document est composé de deux parties: la première traite de l'étude du périphyton et du phytoplancton de la voie maritime du Saint-Laurent, tandis que la deuxième partie est consacrée à la production annuelle de macrophytes. D'après ces études, les eaux du Saint-Laurent seraient, de manière générale, mésotrophiques, c'est-à-dire d'enrichissement intermédiaire. La présence continue de périphyton le long de la voie maritime ainsi que les faibles variations de la diversité des épiphytes témoignent de l'état relativement homogène de la qualité de l'eau de la voie maritime. Le comportement spatio-temporel de la biomasse phytoplanctonique et chlorophyllienne est similaire, bien que les variations spatio-temporelles de la biomasse chlorophyllienne soient moins ponctuées que celles de la biomasse phytoplanctonique. Un échantillonnage a également été effectué afin de mesurer le contenu en azote et en phosphore des tissus de quatre espèces de macrophytes submergés, ainsi que les caractéristiques granulométriques des sédiments, les caractères physico-chimiques de l'eau et le potentiel de fertilité. L'étude permet de préciser dans quelle mesure l'azote ou le phosphore ainsi que les facteurs physiques constituent des facteurs limitant la croissance des macrophytes.

651 **(F14610)**
DIRECTION DE LA CONNAISSANCE DE LA QUALITÉ DU MILIEU (SPEQ) * ***Étude de la diversité du benthos*** * In: Étude du fleuve Saint-Laurent * Environnement Canada; Gouvernement du Québec * mars 1976 * 53p

Cette étude de la diversité du benthos dans le fleuve Saint-Laurent a été réalisée à l'aide d'un échantillonnage de 87 stations situées dans le tronçon de Cornwall à Trois-Rivières, incluant le lac des Deux Montagnes et les rivières des Prairies et des Mille Îles. En moyenne, quatre échantillons par site ont été prélevés et les organismes ont été identifiés. L'étude permet de montrer que les stations à problèmes potentiels se trouvent dans la région de l'Île de Montréal, que la qualité de l'eau de la rive sud est supérieure à celle de la rive nord, que le fleuve Saint-Laurent est de qualité plus pauvre que les lacs, et finalement, que la conception de l'échantillonnage devrait être repensée afin d'obtenir une meilleure précision des résultats.

652 **(F14546)**
SLOTERDIJK, H. * ***Produits toxiques chez les poissons du fleuve Saint-Laurent : rapport annuel 1975-1976*** * In: Étude du fleuve Saint-Laurent * Environnement Canada, Région du Québec, Longueuil, Qc; Gouvernement du Québec, Ministère du Tourisme, de la Chasse et de la Pêche, Montréal, Qc * déc 1976 * 75p

Les concentrations des métaux lourds et des composés organochlorés ont été déterminées dans la chair des poissons capturés en 1975 dans le fleuve Saint-Laurent entre Cornwall et Québec. Les concentrations du mercure et des produits biphényles polychlorés (BPC) dépassent souvent les normes environnementales pour la consommation, 0,5 ppm et 2,0 ppm respectivement, notamment dans la région de Montréal (au lac Saint-Louis et à Longueuil). Le grand brochet et le doré jaune s'avèrent les plus contaminés: en ce qui concerne le mercure, ils en contiennent jusqu'à 3,5 ppm. En ce qui concerne les BPC, le crapet-soleil et la perchaude sont les seules espèces parmi celles examinées qui sont peu contaminées. Les autres espèces présentent des moyennes variant de 1 à 6 ppm, avec des valeurs allant jusqu'à 12 ppm. On a trouvé très peu d'insecticides dans les poissons. Le DDT total et

parfois le dieldrine se trouvent en petites quantités: trace - 1,0 ppm et 0 - 0,1 ppm respectivement, tandis que les autres insecticides sont à peine décelables. Les concentrations de cadmium et de plomb sont élevées, 0,1 - 0,35 ppm et 1 - 4 ppm respectivement, comparativement à celles rapportées par les auteurs consultés. Pour ce qui est des autres métaux, les concentrations (en ppm) sont semblables à celles trouvées ailleurs.(au)

653 (F14544)
GOUIN, D. * ***Qualité générale de l'eau*** * In: Étude du fleuve Saint-Laurent * Environnement Canada; Service de la protection de l'environnement du Québec * mars 1976 * xii, pd

Depuis plusieurs années, on constate une dégradation de la qualité de l'eau le long des rives du fleuve Saint-Laurent. Qu'elle se manifeste par la croissance excessive des plantes aquatiques, par la présence de nappes d'huile ou par la fermeture des plages, cette pollution est reliée à l'utilisation plus intensive de l'eau à des fins de disposition des eaux usées, urbaines, industrielles et agricoles. Il devient de plus en plus difficile d'utiliser l'eau du fleuve Saint-Laurent à d'autres fins, telles que la récréation et l'alimentation en eau potable. Afin de cerner ces conflits interutilisations, un programme d'étude de la qualité physico-chimique de l'eau le long des rives du fleuve Saint-Laurent a été institué en 1975. Ce projet d'une durée de deux ans vise, dans un premier temps, l'identification des principales zones affectées par une pollution organique et bactériologique. La seconde étape, qui sera réalisée en 1976, devrait permettre de localiser également les zones affectées par les substances toxiques. Le chenal maritime a aussi fait l'objet d'une étude afin qu'une comparaison puisse être établie entre la qualité de l'eau le long des rives et celle au centre du chenal.(au)

654 (F14607)
MALO, D.; SEGUIN, R. (COLLAB) * ***Description des mélanges*** * In: Colloque d'études sur le fleuve Saint-Laurent, Québec, mars 1976 * 1976? * 104p

La description du mélange des différents types d'eau dans le fleuve Saint-Laurent regroupe les études sectorielles suivantes: carte isoparamétrique, variation des aires de propagation, aire de propagation des effluents et thermographie. La première étude est un complément d'une carte isoparamétrique de la conductivité produite en 1973-1974. La région étudiée s'étend de Beauharnois à Montréal. Dans la deuxième partie, la variation spatiale des différents types d'eau proposés par la carte isoparamétrique est évaluée. La troisième partie a pour objectif de délimiter les aires de propagation de sources ponctuelles importantes: les effluents urbains de la région de Montréal et les effluents industriels de la région de Sorel. Finalement, l'étude thermographique nous permet de visualiser le mélange des eaux des tributaires dans le fleuve et des eaux douces du fleuve au contact des eaux salines.

655 (F14586)
MALO, D.; GOUIN, D. * ***Évaluation des bilans*** * In: Étude du fleuve Saint-Laurent * Services de protection de l'environnement, Gouvernement du Québec; Ministère des Richesses naturelles, Gouvernement du Canada; Environnement Canada * déc 1977 * 123p * (Rapport technique, no 37)

L'objectif de cette étude consiste à évaluer des bilans pour différents tronçons du fleuve Saint-Laurent. Dans le cadre de cette évaluation, 13 sections transversales ont été choisies. Parmi les paramètres étudiés, on retrouve entre autres la turbidité, la conductivité, le phosphore total, les nitrites-nitrates, l'azote organique, le cadmium, le plomb, le cuivre, le fer, le nickel, etc. Les méthodes d'analyse sont décrites à l'annexe 1.

656 (F14538)
GOUIN, D.; MALO, D. * ***Étude des tributaires*** * In: Étude du fleuve Saint-Laurent * Services de protection de l'environnement, Gouvernement du Québec; Ministère des Richesses naturelles, Gouvernement du Québec; Environnement Canada * mars 1977 * 398p * (Rapport technique, no 38)

Ce rapport vise principalement à présenter les résultats des analyses physico-chimiques et bactériologiques effectuées sur l'eau d'environ 60 tributaires situés entre la frontière ontarienne et la ville de Québec. Les charges de ces tributaires ont déjà fait l'objet d'un rapport (Malo et Gouin, 1977).

657 (F14521)
GOUIN, D.; MALO, D. * ***Qualité générale de l'eau à proximité des rives*** * In: Étude du fleuve Saint-Laurent * Services de protection de l'environnement, Gouvernement du Québec; Ministère des Richesses naturelles, Gouvernement du Québec; Environnement Canada * déc 1977 * 465p * (Rapport technique, no 39)

L'étude des berges de 1976 est une suite à l'étude des berges de 1975. Elle a été réalisée en tenant compte des recommandations suggérées en 1975. La même partie du fleuve a été étudiée. Le choix des stations s'est fait à partir des stations déjà échantillonnées. La fréquence de l'échantillonnage fut considérablement augmentée, mais le nombre de stations fut réduit et les stations les plus représentatives de chaque zone ont été conservées.(au)

658 (F14547)
PAQUIN, G. * ***Rapport des analyses des herbicides, insecticides et PCB dans l'eau des tributaires du Saint-Laurent*** * In: Étude du fleuve Saint-Laurent * Environnement Canada; Gouvernement du Québec, Services de protection de l'environnement, Ministère des Richesses naturelles * août 1977 * iv, 43p

Par son activité, l'homme a répandu dans l'environnement de nombreuses substances organiques. Suite à des recherches, plusieurs de ces substances se sont avérées toxiques pour la vie aquatique et pour l'homme. Quoiqu'on les retrouve parfois en quantités inoffensives dans l'eau de consommation, certaines de ces

substances sont accumulées dans les tissus des organismes aquatiques et peuvent alors atteindre des niveaux toxiques pour les maillons supérieurs de la chaine alimentaire. De plus, la présence de deux ou plusieurs de ces substances peut avoir des actions additives ou synergétiques sur la vie aquatique. C'est pourquoi une surveillance de la qualité des cours d'eau est nécessaire. Dans ce but, le Comité d'étude sur le fleuve Saint-Laurent a commandé un examen de la qualité de l'eau au point de vue des herbicides des types acides phénoxyacétiques et triazines, des insecticides organochlorés et des biphényles polychlorés (BPC). Le cadre de ce travail se situe au niveau des grands et des petits tributaires du Saint-Laurent pour déterminer l'apport de chacun à la qualité du fleuve. Au total, 28 grands tributaires (bassin versant de plus de 100 mi²) et 29 petits tributaires (bassin versant de moins de 100 mi²) ont été échantillonnés, du mois de mai au mois de septembre 1976. Les échantillons ont été prélevés à l'embouchure de chaque tributaire avec le Saint-Laurent. Les analyses ont été effectuées de mai 1976 à juillet 1977. Ce document expose les techniques analytiques utilisées ainsi que les résultats de ces analyses.(au)

659 (F14564)
GRAVEL, Y.; LEVESQUE, L. * ***Localisation et cartographie de zones d'herbiers du fleuve Saint-Laurent : rapport technique no 1*** * Comité d'étude sur le fleuve Saint-Laurent, Sainte-Foy, Qc * déc 1977 * 160p

Dans le but de choisir les principaux herbiers à protéger, une étude a été menée en 1975 et 1976. Celle-ci met l'accent sur la classification et l'identification des principaux types d'herbiers, en regard de l'utilisation des espèces végétales dominantes et des zones d'herbiers du fleuve Saint-Laurent. On a échantillonné, localisé et cartographié les herbiers situés entre Cornwall et Gentilly. Le choix de 47 herbiers a été fait surtout par des reconnaissances en hélicoptère. Des photographies aériennes en couleur et des diapositives ont été utilisées pour interpréter la végétation aquatique et riparienne, mais cette méthode par télédétection est souvent rendue inefficace en raison des conditions météorologiques. Parmi les nombreuses espèces de plantes relevées, on retrouve les algues, le roseau, le scirpe, la zizanie, le potamot et le spartine.

660 (F14565)
BOURGET, A.; LEHOUX, D.; ROSA, J. * ***Importance du Saint-Laurent pour la sauvagine : rapport technique no 2*** * Comité d'étude sur le fleuve Saint-Laurent, Sainte-Foy, Qc * déc 1977 * 51p

Ce rapport final de l'étude relative à l'entente Canada-Québec sur les oiseaux migrateurs dans la région entre Cornwall et Rimouski a pour but de relever les sites de nidification des canards migrateurs afin de les protéger. Des inventaires aériens ont permis de recueillir des observations visuelles enregistrées sur cassette. Des relevés effectués au printemps et en automne démontrent l'abondance et la distribution des canards plongeurs, des oies, des canards de mer et des canards barboteurs. Dans la section entre Trois-Pistoles et Rimouski, on relève une des plus grosses colonies de canards eiders au monde.

661 (F14566)
PAGEAU, G.; TANGUAY, R. * ***Frayères, sites propices à la reproduction et sites de concentration de jeunes poissons d'intérêt sportif et commercial dans le fleuve Saint-Laurent : rapport technique no 3*** * Comité d'étude sur le fleuve Saint-Laurent, Sainte-Foy, Qc * déc 1977 * 440p

Après avoir défini et qualifié les espèces de poissons qui font l'objet de ce rapport, on a établi un système de classification et d'évaluation des frayères, des sites propices à la reproduction et des sites de concentration de jeunes poissons d'intérêt principalement sportif et commercial dans 9 secteurs du fleuve Saint-Laurent entre Cornwall et Montmagny. Les données disponibles ont été interprétées puis traitées à l'ordinateur, ce qui a permis de dresser des listes détaillées et polyvalentes. Il en ressort 155 frayères. Les sites importants (162) ont fait l'objet d'une attention particulière, plus spécialement les 92 sites de valeur prioritaire. Une annexe cartographique illustre les données principales de l'étude. Cette contribution pourra aider à sauvegarder des aires de reproduction de poissons dans le Saint-Laurent, de même que la vie qui y est associée.

662 (F14567)
BERGERON, J. * ***Les poissons et les mollusques : rapport technique no 4*** * Comité d'étude sur le fleuve Saint-Laurent, Sainte-Foy, Qc * déc 1977 * 58p

Ce document correspond à une enquête des pêcheurs, des biologistes et des techniciens de la faune pour établir un inventaire des territoires de pêche sportive et commerciale, en été et en hiver, pour le secteur du fleuve Saint-Laurent compris entre Cornwall et l'île d'Orléans. On y trouve également des cartes de répartition relatives à la concentration des poissons et des mollusques. On peut capturer une cinquantaine d'espèces de poissons, de mollusques et de crustacés. On relève 183 pêcheries fixes, et l'engin le plus utilisé est le verveux.

663 (F14568)
COUSINEAU, G. * ***Étude des relations entre l'infection des anguilles et la contamination du milieu : rapport technique no 5*** * Comité d'étude sur le fleuve Saint-Laurent * déc 1977 * 167p

Ce rapport décrit une étude des relations entre l'infection des anguilles et la contamination du milieu. Les prélèvements bactériens ont été effectués principalement sur des anguilles saines, capturées dans différents cours d'eau au Québec. Il est certain que des parasites, et à l'occasion des aeronamas virulents, ont été responsables d'une importante mortalité chez l'anguille du fleuve Saint-Laurent.

664 (F14569)
KEIGHAN, E. * ***Caractérisation du niveau d'enrichissement et de la toxicité des eaux du bassin du fleuve Saint-Laurent : rapport technique no 6*** *

Comité d'étude sur le fleuve Saint-Laurent * déc 1977 * 153p

On constate deux types de dégradation de la qualité de l'eau du fleuve Saint-Laurent et de ses tributaires. Le premier type de dégradation est lié à la présence de substances toxiques dans les eaux. Le deuxième type de dégradation de la qualité de l'eau peut se résumer à la présence de substances nutritives (azote et phosphore principalement) en excès dans ces eaux. Ces deux types de dégradation ont été évalués à l'aide d'une bioanalyse en laboratoire, et l'organisme utilisé pour la bioanalyse est une algue (Selenastrum capricornutum). Les résultats montrent qu'une eau fortement toxique inhibe la croissance de l'algue, même si l'eau est riche en substances nutritives. Les résultats sont basés sur une évaluation des effets des concentrations respectives en substances nutritives et toxiques. Pour certaines interprétations complémentaires, il sera essentiel de connaître les débits aux stations d'échantillonnage afin d'évaluer l'importance des apports (la charge) des deux types de dégradation mentionnés ci-dessus.

665 (F14570)
SLOTERDIJK, H. * ***Accumulation des métaux lourds et des composés organochlorés dans la chair des poissons du fleuve Saint-Laurent : rapport technique no 7*** * Comité d'étude sur le fleuve Saint-Laurent * déc 1977 * 181p

Les concentrations des métaux lourds et des composés organochlorés ont été déterminées dans la chair des poissons (achigan à petite bouche, barbotte brune, crapet-soleil, doré jaune, esturgeon de lac, grand brochet, meunier noir, perchaude et quelques autres espèces) capturés en 1975 et 1976 entre Cornwall et Québec. Les concentrations de mercure et des BPC dépassent souvent les normes gouvernementales pour la consommation des poissons (0,5 et 2,0 ppm respectivement) notamment dans la région de Montréal (incluant le lac Saint-François). Le grand brochet et le doré jaune s'avèrent les plus contaminés en ce qui concerne le mercure: ils en contiennent jusqu'à 3,5 pmm et leur moyenne varie entre 0,3 et 1,2 ppm. En ce qui concerne les BPC, le crapet-soleil et la perchaude sont relativement peu contaminés. Les autres espèces présentent des moyennes variant de 0,3 à 6 ppm, avec des valeurs allant jusqu'à 15 ppm (avec une valeur extrême de 27 ppm). Les concentrations des autres métaux sont en général peu élevées, surtout si l'on considère les normes gouvernementales. On a trouvé peu d'insecticides dans la chair des poissons. Les données montrent que les métaux lourds (excluant le mercure) ne sont pas bioconcentrés en montant la chaîne alimentaire, tandis que le mercure augmente en concentration. De plus, le mercure est le seul métal pour lequel il y a une régression positive entre la concentration dans la chair et la taille du poisson. L'auteur pense que la raison de ce comportement découle, entre autres, de la formule chimique des métaux: le méthyle de mercure par opposition aux métaux inorganiques. Les BPC sont également bioconcentrés, mais l'accumulation est influencée par la teneur en lipides des tissus. Des recommandations quant à la consommation des poissons contaminés sont incluses dans le document, ainsi que des suggestions pour les programmes de surveillance et de recherche.

666 (F14571)
BÉLAND, J.; DEMERS, R. * ***La teneur en substances toxiques dans les plantes aquatiques et les facteurs limitant leur croissance : rapport technique no 8*** * Comité d'étude sur le fleuve Saint-Laurent * déc 1977 * 179p

Dans le cadre de l'entente Canada-Québec pour une étude sur le fleuve Saint-Laurent, les Services de protection de l'environnement du Québec ont entrepris, au cours de l'été 1975, une étude sur la production annuelle des macrophytes du fleuve. Les principaux objectifs de cette étude visent la détermination des facteurs limitant la croissance des plantes aquatiques et la détermination de la teneur en éléments chimiques de ces plantes. Les résultats de cette étude portent à croire que l'utilisation des plantes aquatiques comme indicateur d'intoxication demeure un élément indispensable à toute étude relative à l'intoxication d'un milieu aquatique par des éléments chimiques.

667 (F14572)
PROVENCHER, M. * ***Étude du phytoplancton du fleuve Saint-Laurent et de ses tributaires : rapport technique no 9*** * Comité d'étude sur le fleuve Saint-Laurent * déc 1977 * 270p

Ce rapport traite essentiellement de la compréhension des phénomènes de production primaire phytoplanctonique des berges et des tributaires du fleuve Saint-Laurent. Le travail décrit les productions phytoplanctoniques et en dégage leur signification. On y localise les fortes productions dans le temps et dans l'espace. Finalement, dans le but d'estimer les risques de modifications chimiques et physiques du milieu sur la production algologique, on tente d'établir le degré de contrôle que nutrients et facteurs physiques exercent sur les productions phytoplanctoniques naturelles.

668 (F14573)
LEVASSEUR, H. * ***Étude du benthos du fleuve Saint-Laurent : rapport technique no 10*** * Comité d'étude sur le fleuve Saint-Laurent * déc 1977 * 280p

Pour ce rapport, 144 stations de macroinvertébrés benthiques ont été échantillonnées le long du fleuve Saint-Laurent au cours des mois de juillet et août 1976. La région couverte s'étend de Cornwall à l'île d'Orléans. On trouve en annexe les résultats obtenus à chacune des stations, de même que la valeur des indices de diversité et d'équitabilité (annexe B).

669 (F14574)
GOUIN, D.; MALO, D. * ***Étude de la qualité générale de l'eau : rapport technique no 11*** * Comité d'étude sur le fleuve Saint-Laurent * déc 1977 * 363p

L'étude de la qualité générale de l'eau vise à définir la qualité de l'eau du fleuve Saint-Laurent à proximité des berges, en fonction de l'utilisation qu'on peut en faire. Ce rapport considère que le plein usage de l'eau

englobe les critères les plus sévères parmi les différentes utilisations considérées précédemment. Cent douze stations représentatives ont été échantillonnées à une vingtaine de reprises durant l'été 1976. Les paramètres mesurés étaient les suivants: conductivité, turbidité, couleur vraie, solides en suspension, azote, phosphore, demande chimique en oxygène, carbone particulaire, cadmium, chrome, cuivre, nickel, plomb, zinc, mercure, coliformes et coliformes fécaux. Les méthodes analytiques sont décrites à l'annexe I. Le lac des Deux Montagnes, la rivière des Prairies et la rivière des Mille Îles ont été inclus dans la zone à l'étude.

670 (F14575)
MALO, D.; GOUIN, D. * ***Incidence des rejets industriels et municipaux (tome I) : rapport technique no 12*** * Comité d'étude sur le fleuve Saint-Laurent * déc 1977 * 247p

Cette étude vise à déterminer la qualité de l'eau dans les zones de déversement des eaux usées municipales et industrielles. On sera alors en mesure d'évaluer l'impact des sources ponctuelles importantes sur la qualité de l'eau et des sédiments du fleuve Saint-Laurent. La qualité de l'eau à la sortie des émissaires est comparée à celle du cours d'eau récepteur à proximité du site de déversement et de celle du fleuve en général. L'impact à proximité des rejets est ainsi considéré. Parmi les 132 émissaires étudiés, 123 présentent une contamination par les substances nutritives, 100 par les substances toxiques, 57 par les paramètres physiques et 30 par les bactéries.

671 (F14602)
MALO, D.; GOUIN, D. * ***Incidences des rejets industriels et municipaux (tome II: annexes) : rapport technique no 12*** * Comité d'étude sur le fleuve Saint-Laurent * déc 1977 * 437p

Ce rapport, soumis au Comité d'étude sur le fleuve Saint-Laurent, présente une étude statistique sur l'incidence des rejets industriels et municipaux qui contaminent les eaux du Saint-Laurent. Il contient 10 annexes, dont chacune traite d'un aspect particulier relié aux résultats d'analyses effectuées entre Cornwall et Québec. On y trouve entre autres les types d'industries et leurs eaux résiduaires, la localisation des stations échantillonnées et leur description, une description des méthodes analytiques utilisées par les trois laboratoires (Services de protection de l'environnement du Québec, Environnement Canada et Sodexen Inc.), des comparaisons de qualité des rejets, des statistiques et un calcul de la qualité moyenne des eaux usées à plusieurs endroits le long du tronçon considéré. Il s'agit donc d'une étude détaillée des eaux du Saint-Laurent.

672 (F14576)
GOUIN, D.; MALO, D. * ***Description des mélanges : rapport technique no 13*** * Comité d'étude sur le fleuve Saint-Laurent * déc 1977 * 43p

Ce rapport regroupe les résultats des études sur la caractérisation du mélange des eaux des affluents à celles du fleuve Saint-Laurent. Ce rapport tient compte de deux éléments permettant de décrire le mélange des eaux, soit la conductivité et la température. Par les deux types d'étude, on peut conclure que le mélange des eaux devient complet dans la région de Québec.

673 (F14577)
MALO, D.; GOUIN, D. * ***Caractérisation des apports : rapport technique no 14*** * Comité d'étude sur le fleuve Saint-Laurent * déc 1977 * 332p

Ce rapport identifie les sources de pollution du fleuve Saint-Laurent par secteur, la contribution relative de chacune des sources pour les solides en suspension, les éléments nutritifs et les toxiques inorganiques. Ce rapport discute ensuite de l'accumulation ou de l'exportation de ces substances tout le long du fleuve, et donne une liste de priorités d'intervention pour les municipalités, les industries et les tributaires. Ces priorités sont basées sur une relation entre la qualité de l'eau du fleuve et les charges établies de ces sources de contaminants.

674 (F14578)
SERODES, J.B. * ***Qualité des sédiments de fond du fleuve Saint-Laurent entre Cornwall et Montmagny : rapport technique no 15*** * Comité d'étude sur le fleuve Saint-Laurent * avril 1978 * 467p

Ce rapport rassemble en un seul document les résultats de cinq années d'études sur les sédiments de fond du fleuve Saint-Laurent. Le premier chapitre discute l'historique des études et les buts du rapport synthèse. Le deuxième chapitre traite du cheminement des études sédimentologiques et le troisième de la qualité des sédiments. Le quatrième chapitre traite de l'évolution dans le temps de la qualité des fonds par l'analyse des résultats obtenus sur 23 carottes prélevées dans des zones de sédimentation; dans ce chapitre, on a aussi évalué le degré d'aptitude à l'accumulation de polluants des régions lacustres du fleuve. Enfin, le chapitre 5 dresse un bilan des connaissances sur la qualité des fonds sous forme de carte synthèse présentant les zones préférentielles d'accumulation des polluants avec leurs caractéristiques, ainsi que des tableaux récapitulatifs de la qualité des fonds de chaque région.

675 (F14579)
SYDOR, M. * ***Étude d'un modèle bidimensionnel pour le fleuve Saint-Laurent : rapport technique no 16*** * Comité d'étude sur le fleuve Saint-Laurent * janv 1978 * 136p

Cette publication fait partie de la série de rapports techniques du Comité d'étude sur le fleuve Saint-Laurent. La simulation du fleuve Saint-Laurent par modèle mathématique a été entreprise dans le but de mieux connaître le comportement du fleuve afin de pouvoir utiliser un modèle d'évolution de nappes d'huile. Ce rapport décrit l'étude d'un modèle bidimensionnel dont l'élaboration est fondée sur la dérivation d'équations différentielles partielles à l'état non permanent des grandes ondes. Les solutions numériques sont basées sur l'intégration verticale de l'équation de base de l'écoulement d'un fluide et des

équations de continuité et de conservation de masse pour un liquide incompressible dans le système de coordonnées d'Euler. Les effets de viscosité sont introduits dans l'équation de mouvement, et l'utilisation de la formule empirique de friction tient compte de la pratique courante en ingénierie.

676 (F14598)
BÉLAND, J.; BOUCHER, R.; LONGPRÉ, G.; PELLERIN, A. * ***Étude de la qualité des eaux, fleuve Saint-Laurent, tronçon Québec-Les Escoumins (étude spéciale de Montréal et les tributaires) : répertoire des résultats d'analyses (1974) : tome 1*** * In: Étude du fleuve Saint-Laurent, tronçon Montréal-Les Escoumins * Services de protection de l'environnement, Gouvernement du Québec; Ministère des Richesses naturelles, Gouvernement du Québec; Environnement Canada * févr 1976 * 88p

Ce rapport est une présentation de tous les résultats des analyses physico-chimiques pour les études de 1975 sur le fleuve Saint-Laurent. Dans ce rapport, on présente la localisation des stations pour chacun des projets, le mode de codification des stations d'échantillonnage et des paramètres, ainsi qu'une description des méthodes analytiques. Cette publication constitue une source d'information pour tous ceux dont le travail est en relation directe ou indirecte avec la qualité des eaux du fleuve Saint-Laurent.

677 (F14599)
BÉLAND, J.; BOUCHER, R.; LONGPRÉ, G.; PELLERIN, A. * ***Étude de la qualité des eaux, fleuve Saint-Laurent, tronçon Québec-Les Escoumins (étude spéciale de Montréal et les tributaires) : répertoire des résultats d'analyses (1974) : tome 2*** * In: Étude du fleuve Saint-Laurent, tronçon Montréal-Les Escoumins * Services de protection de l'environnement, Gouvernement du Québec; Ministère des Richesses naturelles, Gouvernement du Québec; Environnement Canada * févr 1976 * pd

Ce volume contient les résultats d'analyses obtenus lors de l'étude de la qualité des eaux du fleuve Saint-Laurent pour le tronçon Québec-Les Escoumins concernant les sections transversales, l'étude des rives et des îles ainsi que l'étude des tributaires.

678 (F14600)
BÉLAND, J.; BOUCHER, R.; LONGPRÉ, G.; PELLERIN, A. * ***Étude de la qualité des eaux, fleuve Saint-Laurent, tronçon Québec-Les Escoumins (étude spéciale de Montréal et les tributaires) : répertoire des résultats d'analyses (1974) : tome 3*** * In: Étude du fleuve Saint-Laurent, tronçon Montréal-Les Escoumins * Services de protection de l'environnement, Gouvernement du Québec; Ministère des Richesses naturelles, Gouvernement du Québec; Environnement Canada * févr 1976 * pd

Ce troisième volume sur l'étude de la qualité des eaux du fleuve Saint-Laurent donne les résultats des analyses pour Montréal, Québec, La Malbaie et Giroq.

679 (F14534)
GOUIN, D.; MALO, D.; LONGPRÉ, G. * ***Qualité physico-chimique des eaux du fleuve Saint-Laurent : répertoire des résultats d'analyses (1975) : tome 1*** * In: Étude du fleuve Saint-Laurent * Services de protection de l'environnement, Gouvernement du Québec; Ministère des Richesses naturelles, Gouvernement du Québec; Environnement Canada * mars 1976 * 88p

Ce rapport est une présentation de tous les résultats des analyses physico-chimiques pour l'ensemble des études de 1975 sur le fleuve Saint-Laurent. Dans ce rapport, on présente la localisation des stations pour chacun des projets, le mode de codification des stations d'échantillonnage et des paramètres, ainsi qu'une description des méthodes analytiques. Cette publication constitue une source d'information pour tous ceux dont le travail est en relation directe ou indirecte avec la qualité des eaux du fleuve Saint-Laurent.

680 (F14535)
GOUIN, D.; MALO, D.; LONGPRÉ, G. * ***Qualité physico-chimique des eaux du fleuve Saint-Laurent : répertoire des résultats d'analyses (1975) : tome 2*** * In: Étude du fleuve Saint-Laurent * Services de protection de l'environnement, Gouvernement du Québec; Ministère des Richesses naturelles, Gouvernement du Québec; Environnement Canada * mars 1976 * pd

Ce deuxième volume présente le répertoire des résultats d'analyses des propriétés physico-chimiques des eaux du fleuve Saint-Laurent en 1975. On donne les résultats de l'étude du chenal entre Kingston et Percé, la variation saisonnière des aires de propagation, la variation journalière des aires de propagation ainsi que les sections transversales.

681 (F14536)
GOUIN, D.; MALO, D.; LONGPRÉ, G. * ***Qualité physico-chimique des eaux du fleuve Saint-Laurent : répertoire des résultats d'analyses (1975) : tome 3*** * In: Étude du fleuve Saint-Laurent * Services de protection de l'environnement, Gouvernement du Québec; Ministère des Richesses naturelles, Gouvernement du Québec; Environnement Canada * mars 1976 * pd

Ce troisième volume présente le répertoire des résultats d'analyses des propriétés physico-chimiques des eaux du fleuve Saint-Laurent en 1975. On donne les résultats de l'étude de la berge du côté nord, de l'étude de la berge du côté sud, ainsi que de l'étude des tributaires des événements hydrologiques.

682 (F14537)
GOUIN, D.; MALO, D.; LONGPRÉ, G. * ***Qualité physico-chimique des eaux du fleuve Saint-Laurent : répertoire des résultats d'analyses (1975) : tome 4*** * In: Étude du fleuve Saint-Laurent * Services de protection de l'environnement, Gouvernement du Québec; Ministère des Richesses naturelles, Gouvernement du Québec; Environnement Canada * mars 1976 * pd

Ce quatrième volume présente le répertoire des résultats d'analyses des propriétés physico-chimiques des eaux du fleuve Saint-Laurent en 1975. On donne

les résultats de l'étude des tributaires, de l'étude des effluents de Montréal et de Sorel, ainsi que de l'étude de la berge des îles.

683 (F14539)
MALO, D.; GOUIN, D.; LONGPRÉ, G. * ***Qualité physico-chimique des eaux du fleuve Saint-Laurent : répertoire des résultats d'analyses (1976) : tome 1*** * In: Étude du fleuve Saint-Laurent * Services de protection de l'environnement, Gouvernement du Québec; Ministère des Richesses naturelles, Gouvernement du Québec; Environnement Canada * mars 1977 * 179p

Ce rapport est une présentation des résultats d'analyses physico-chimiques de l'eau du fleuve Saint-Laurent pour l'ensemble des études effectuées en 1976. Les études sont regroupées dans la banque de données de la façon suivante: étude du chenal entre Kingston et Percé; étude des sections transversales; étude de la qualité de l'eau le long des berges de la rive nord et de la rive sud, étude des petits tributaires et des tributaires; étude des effluents; étude de la qualité de l'eau le long des berges des îles, de la rivière des Prairies et de la rivière des Mille Îles. Ce rapport présente la localisation et la codification des stations d'échantillonnage pour tous les projets, les paramètres mesurés ainsi que les méthodes analytiques.

684 (F14540)
MALO, D.; GOUIN, D.; LONGPRÉ, G. * ***Qualité physico-chimique des eaux du fleuve Saint-Laurent : répertoire des résultats d'analyse (1976) : tome II (i.e. analyses)*** * In: Étude du fleuve Saint-Laurent * Services de protection de l'environnement, Gouvernement du Québec; Ministère des Richesses naturelles, Gouvernement du Québec; Environnement Canada * mars 1977 * pd

Ce rapport contient les résultats des analyses physico-chimiques de 1976 des eaux du fleuve Saint-Laurent, comprenant la rive nord, la rive sud et les petits tributaires.

685 (F14541)
MALO, D.; GOUIN, D.; LONGPRÉ, G. * ***Qualité physico-chimique des eaux du fleuve Saint-Laurent : répertoire des résultats d'analyse (1976) : tome III (i.e. analyses)*** * In: Étude du fleuve Saint-Laurent * Service de protection de l'environnement, Gouvernement du Québec; Ministère des Richesses naturelles, Gouvernement du Québec; Environnement Canada * mars 1977 * pd

Ce rapport contient les résultats des analyses physico-chimiques de 1976 des eaux du fleuve Saint-Laurent comprenant les tributaires.

686 (F14542)
MALO, D.; GOUIN, D.; LONGPRÉ, G. * ***Qualité physico-chimique des eaux du fleuve Saint-Laurent : répertoire des résultats d'analyse (1976) : tome IV (i.e. analyses)*** * In: Étude du fleuve Saint-Laurent * Services de protection de l'environnement, Gouvernement du Québec; Ministère des Richesses naturelles, Gouvernement du Québec; Environnement Canada * mars 1977 * pd

Ce rapport contient les résultats des analyses physico-chimiques de 1976 des eaux du fleuve Saint-Laurent comprenant les effluents, la rivière des Prairies et la rivière des Mille Îles.

687 (F14618)
GOUIN, D.; MALO, D. * ***Répertoire des caractéristiques socio-économiques des bassins versants du fleuve Saint-Laurent*** * Services de protection de l'environnement du Québec * nov 1977 * 420p

Ce répertoire vise à présenter les principales caractéristiques du bassin du fleuve Saint-Laurent selon la division naturelle que constituent les bassins de drainage. Les caractéristiques considérées dans ce répertoire sont réparties parmi les groupes suivants: utilisation du territoire, cultures, élevage, industries, alimentation en eau potable et élimination des eaux usées. Parmi ces groupes on retrouve l'information ayant trait aux superficies en culture, paturage, jachère, terres à bois et autres, ainsi qu'aux populations animales. Les données proviennent du recensement canadien de 1971, effectué selon des divisions administratives qui ont été regroupées selon une division physiographique basée sur les bassins hydrographiques. Les renseignements sur la structure industrielle sont basés sur le nombre d'employés dans chacun des grands groupes d'industries. Enfin, la population desservie par un réseau d'égout ainsi que le nombre de personnes dont l'eau de consommation ou les eaux usées sont soumises à un traitement, sont également compris dans ce répertoire.

688 (F14596)
MALO, D.; GOUIN, D. * ***Répertoire des résultats d'analyses (1977)*** * In: Étude du fleuve Saint-Laurent * Services de protection de l'environnement, Gouvernement du Québec; Ministère des Richesses naturelles, Gouvernement du Québec; Environnement Canada * mars 1978 * 53p

Ce rapport présente tous les résultats des analyses physico-chimiques relatives à l'étude des tributaires de 1977. Les objectifs visés par cette étude étaient tout d'abord de caractériser la qualité de l'eau à l'embouchure des tributaires situés entre Québec et Sept-Îles, et entre Lévis et Sainte-Anne-des-Monts, puis de quantifier les apports de chacun d'entre eux. On retrouve les résultats des analyses en annexe.

11.1.1 Ottawa River Basin / Bassin versant de la rivière des Outaouais

Final report / Rapport définitif

689 (F06563)
COMITÉ DE PLANIFICATION DE LA RÉGULARISATION DE LA RIVIÈRE DES OUTAOUAIS * ***Rapport final*** * déc 1980 * 96p

Ce rapport a pour but d'émettre certaines recommandations destinées à réduire les dommages causés par les inondations dans la partie inférieure du bassin de la rivière des Outaouais et plus particulièrement dans la région de Montréal. Les auteurs donnent les principales caractéristiques du bassin de la rivière et traitent de l'utilisation de l'eau. Ils définissent le système hydraulique (réservoirs, hydroélectricité) et fournissent des informations sur la régularisation au moyen des réservoirs. On présente ensuite le problème des inondations et des embâcles de glace, suivi de solutions partielles. On décrit les deux modèles mathématiques développés par le Comité dans le but d'améliorer la gestion des ouvrages de la rivière des Outaouais; l'un pour la prévision des apports naturels et l'autre pour la régularisation de tout le système. Le Comité de planification a également étudié la nature et les responsabilités d'une structure administrative permanente qui permettrait une opération intégrée des principaux réservoirs du système, tout en assurant une liaison appropriée avec le Conseil international de contrôle du fleuve Saint-Laurent. En conclusion, l'opération intégrée des barrages réservoirs existants est un moyen efficace pour réduire les dommages causés par les inondations dans le bassin de la rivière des Outaouais et dans la région de Montréal. Elle permettrait aussi de maintenir les autres usages tout en respectant les contraintes connues présentement. Le modèle de prévision et d'optimisation du débit peut être utilisé comme outil pour accomplir cette opération intégrée. Le degré de protection pouvant être atteint dépend de l'ampleur et de la période d'occurrence des pointes de crues. Six annexes suivent ce volume. Elles traitent de la régularisation et de la prévision du débit, des crues, des améliorations administratives et de l'information du public.

690 (F00001)
Comité sur la régularisation des eaux, région de Montréal, rapport final * Ministère des Richesses naturelles du Québec; Environnement Canada, Québec, Qué * 1976 * 123 p

Suite à la signature d'une entente fédérale-provinciale, un comité sur la régularisation des eaux dans la région de Montréal a été formé. Ce rapport technique constitue une brève synthèse des études poursuivies par le comité sur les possibilités de régularisation des débits des eaux du fleuve Saint-Laurent, du lac des Deux Montagnes, du lac Saint-Louis, de la rivière des Prairies et de la rivière des Mille Îles. L'objectif poursuivi est de minimiser les dangers d'inondations dues aux embâcles de printemps et les problèmes de pollution des eaux en cas d'étiage sévère. Les correctifs envisagés par le comité sont: la régularisation des apports d'eau en amont de Montréal, la construction d'ouvrages de génie dans la région de Montréal, et l'application de solutions administratives telles des mesures de zonage, de relocalisation et d'immunisation. Pour chacun de ces correctifs, le comité a fait l'examen de leur impact sur l'environnement; il a également effectué une comparaison des coûts et de leur efficacité respective. Des recommandations sont émises par les membres du comité.

691 (039701)
COMMITTEE ON FLOW REGULATION, MONTREAL REGION * ***Committee on Flow Regulation, Montreal, final report*** * Gouvernement du Québec, Ministère des Richesses naturelles; Environment Canada * 1976 * 73p

Following the signing of a federal-provincial agreement, a bipartite committee was formed to study flow regulations in the Montreal region. This technical report summarizes and briefly synthesizes the various studies carried out by the committee on flow regulation of the St Lawrence River, des Prairies and Mille Îles rivers, lakes St-Louis and des Deux Montagnes. The objective of this study was to minimize the risk of floods due to heavy spring runoffs and ice-jams, as well as the pollution problems related to severe low-water periods. To reach this objective, three approaches were studied: upstream flow regulation of the St Lawrence River, engineering works within the Montreal region, and institutional measures such as flood-risk mapping, zoning, relocating, flood-proofing and forecasting. Conclusions were drawn by comparing the relative cost and effectiveness, and assessing the environmental impacts of each approach.

692 (059105)
HARVEY, A.; ODELL, R.M. (CHAIRMAN) * ***Ottawa River Regulation Planning Committee, final report*** * Ottawa River Regulation Planning Committee, Quebec * Dec 1980 * 7v

This final report and six appendices present nine recommendations designed to reduce flood damage in the lower Ottawa River Basin, particularly in the Montreal region, by the Ottawa River Regulation Planning Committee formed in 1977 by the governments of Canada, Quebec and Ontario to study problems associated with and make recommendations concerning: 1) improved regulation of the Ottawa River to reduce flood damage, particularly in the Montreal region; 2) a flood forecast and warning system for the basin; 3) a permanent Ottawa River regulation body; and 4) liaison with the International St Lawrence River Board of Control. The development of an inflow forecasting and optimization model that permits integration of reservoir operation and reduces peak flows in the lower river is

described. This model allows trade-offs between probable flood damage losses and losses or gains in hydro-electric energy production; represents river configurations and includes constraints on levels, flows, and energy outputs. The forecasting and flood routing capability of the model to provide information required for timely issuance of flood warnings is described. The nature and responsibilities of a permanent administrative structure that would permit the integrated operation of the principal reservoirs of the Ottawa River system and liaison with the International St Lawrence River Board of Control are discussed.

Miscellaneous reports / Rapports divers

693 (079498)
FEDERAL-PROVINCIAL WORKING GROUP ON WATER QUALITY IN THE OTTAWA RIVER • ***Report of the federal-provincial working group on water quality in the Ottawa River*** = Rapport du groupe de travail fédéral/provincial de la qualité de l'eau de la rivière des Outaouais • Sept 1977 • vp

This document contains a short report and two appendices, one being a very detailed review. The report gives the organization of the federal-provincial Ottawa River Working Group and the terms of reference. Program considerations for the 1976-77 period are presented and a summary of findings of Task Force no 1 is given. This summary of findings show that there are wide differences between Ontario and Quebec in municipal pollution control programs: on the Quebec side, only 3 of 16 municipalities treat their wastes, whereas in Ontario all but one municipalities provide some form of treatment prior to discharge. Moreover, the pulp and paper industry on the Quebec side is responsible for the largest amount of suspended solids found in the water. As a conclusion, the working group gives some recommendations concerning the completion of the Hull-Outaouais treatment project, phosphorus removal at treatment facilities and industrial effluent quality. The second appendix gives the review of municipal and industrial pollution control programs on the Ottawa River as well as other environmental considerations such as the influence of tributaries, wastewater disinfection, inputs of diffuse sources and the importance of pollution by contaminants.

694 (F14185)
GROUPE DE TRAVAIL FÉDÉRAL-PROVINCIAL DE LA QUALITÉ DE L'EAU • ***Rapport du groupe de travail fédéral/provincial de la qualité de l'eau de la rivière des Outaouais*** = Report of the federal-provincial working group on water quality in the Ottawa River • sept 1977 • pd

Ce document contient un rapport et deux annexes. Dans le rapport, on trouve la structure et le mandat du groupe de travail ainsi que des considérations relatives au programme de 1976-1977. Ensuite, le résumé des résultats du sous-groupe de travail no 1 est présenté. Ces résultats montrent une forte différence entre l'Ontario et le Québec au niveau du traitement des eaux usées municipales, puisque seulement trois des 16 municipalités québécoises concernées traitent leurs eaux usées alors que toutes les municipalités concernées de l'Ontario (sauf une) le font. De plus, l'industrie québécoise des pâtes et papiers est en grande partie responsable de la teneur en matières en suspension dans l'eau de la rivière. En conclusion, le groupe de travail émet cinq recommandations visant à améliorer la situation. La seconde annexe détaille les réalisations et le programme de lutte contre la pollution dans les municipalités et dans l'industrie. Enfin, le sous-groupe de travail présente d'autres sujets tels que l'influence des tributaires, la désinfection des eaux usées, la pollution par des sources diffuses et l'importance des contaminants.

695 (079496)
FEDERAL-PROVINCIAL WORKING GROUP ON WATER QUALITY IN THE OTTAWA RIVER • ***A review of water pollution control programs on the Ottawa River*** = Revue des programmes de lutte contre la pollution de l'eau de la rivière des Outaouais • May 1978 • 27p

This document gives the organization of the working group formed to review water quality management and pollution control programs in the Ottawa River and its terms of reference. This part is followed by program considerations for 1976-77 and a summary of findings of this program. Wide differences were noted between the two provinces in municipal pollution control programs: all but one municipality in Ontario are providing some treatment prior to discharge of their wastes in the river, whereas on the Quebec side only 3 of 16 municipalities treat their wastes. The pulp and paper industry on the Quebec side contributes largely to the pollution of the river. According to these findings, the working group recommends that priority be given to the completion of the Hull-Outaouais sewage collection and treatment project, and that plans be prepared for the installation of treatment facilities at all municipalities along the river. It is also recommended that phosphorus removal be required for sewage treatment plans. There should be a setting of target loadings for the pulp and paper mills discharging directly to the Ottawa River.

696 (F14183)
GROUPE DE TRAVAIL FÉDÉRAL-PROVINCIAL DE LA QUALITÉ DE L'EAU DE LA RIVIÈRE DES OUTAOUAIS • ***Revue des programmes de lutte contre la pollution de l'eau de la rivière des Outaouais*** = A review of water pollution control programs on the Ottawa River • mai 1978 • pd

Ce document décrit d'abord la structure et le mandat du groupe de travail formé afin d'étudier la gestion de la qualité des eaux et les programmes antipollution dans la rivière des Outaouais, ainsi que les considérations relatives au programme de 1976-1977. Ensuite, un résumé des résultats du sous-groupe no 1 est

présenté. Il y a une forte différence au niveau municipal entre les provinces de Québec et d'Ontario, puisque toutes les municipalités ontariennes (sauf une) traitent leurs déchets tandis que 3 municipalités québécoises sur 16 le font. Au niveau industriel, le secteur des pâtes et papiers au Québec est le principal responsable de la pollution des eaux. En fonction de ces résultats, le groupe de travail recommande d'accorder la priorité à l'achèvement des stations d'épuration de la CRO, et à l'installation de stations de traitement pour toutes les municipalités rejetant leurs déchets dans la rivière. De plus, ces stations devraient inclure une déphosphatation dans le traitement. En ce qui concerne les pâtes et papiers, les effluents devraient être conformes aux exigences fédérales d'épuration.

697 (066468)
FEDERAL-PROVINCIAL TECHNICAL WORKING GROUP ON WATER QUALITY IN THE OTTAWA RIVER, BACTERIOLOGICAL TASK FORCE • ***Report of the Bacteriological Task Force of the Federal/Provincial Technical Working Group on Water Quality in the Ottawa River*** = Rapport du groupe d'étude bactériologique du groupe technique de travail fédéral-provincial sur la qualité de l'eau de la rivière des Outaouais • Aug 1979 • 25p

This report examines past data, performs analyses of data and interprets data, identifies problems related to bacteriology, and identifies data gaps in a review of water quality of the Ottawa River. It is found that microbiological problems are largely related to inputs of raw or inadequately treated sanitary wastes and to discharges from food plants, pulp mills and other industries, and relate particularly to public health hazards to the use of polluted waters for recreational purposes. Improvement in the microbiological quality of effluents and receiving water can result from improvement in point source waste treatment procedures. Wastewater discharges should not present a serious threat to either public health or the aquatic environment. About 100 different types of enteric viruses are present on occasion in sewage-polluted water. Protocols for future bacterial water quality monitoring include examination of existing recreational water criteria, test parameter selection and monitoring studies, and selection of river areas for monitoring study. It is felt that only an intensive monitoring study could provide suitable microbiological data to meet control needs and to characterize the effect of various discharges on Ottawa River microbiological quality.

698 (F14611)
GROUPE TECHNIQUE DE TRAVAIL FÉDÉRAL-PROVINCIAL SUR LA QUALITÉ DE L'EAU DE LA RIVIÈRE DES OUTAOUAIS • ***Rapport du groupe d'étude bactériologique*** = Report of the bacteriological task force • Environnement Canada; Ministère de l'Environnement de l'Ontario; Ministère de l'Environnement du Québec • août 1979 • ii, 27p

Ce rapport contient les conclusions du Sous-groupe d'étude bactériologique formé par le Groupe de travail technique fédéral-provincial sur la qualité de l'eau dans la rivière des Outaouais. Les objectifs du sous-groupe étaient d'examiner les données existantes, d'analyser et d'interpréter ces données, de déterminer les problèmes bactériologiques et d'identifier les lacunes ainsi que les répétitions dans les données. On donne une description des problèmes microbiologiques et on présente un examen de données bactériologiques. Le protocole en vue d'une surveillance bactériologique de l'eau donne les critères actuels de qualité pour l'eau de baignade, la sélection des paramètres de contrôle, la sélection des secteurs à contrôler dans la rivière et les propositions en vue de l'acquisition des données.

699 (F14182)
GROUPE D'ÉTUDE DES SELS NUTRITIFS • ***Rapport du groupe d'étude des sels nutritifs du groupe technique de travail fédéral-provincial sur la qualité de l'eau de la rivière des Outaouais*** = Report of the nutrient task force of the federal-provincial technical working group on water quality in the Ottawa River • mai 1980 • vi, 108p

Ce document présente une analyse détaillée des données recueillies sur la qualité des eaux de la rivière des Outaouais, ainsi que les principaux résultats et des recommandations. L'analyse des données comporte une description des méthodes utilisées pour mesurer la qualité de l'eau et le transport des sels nutritifs, ainsi qu'une discussion sur l'évolution et la répartition du phosphore, de l'azote et de l'oxygène dissous. Dans les résultats, le groupe d'étude donne les variations de concentration en phosphore et en azote pour les différents tronçons de la rivière et déclare que la teneur en oxygène dissous est acceptable. En fonction de ces résultats, le groupe émet cinq recommandations: étudier plus en détail la Région de la Capitale nationale, mener une étude approfondie de l'apport de sels nutritifs, déterminer les raisons de la baisse de teneur en oxygène dissous, mettre sur pied un programme de contrôle de la qualité de l'eau et définir des normes de qualité pour la teneur en sels nutritifs.

700 (079495)
OTTAWA RIVER WATER QUALITY NUTRIENTS TASK FORCE • ***Report of the Nutrient Task Force of the Federal-Provincial Technical Working Group on water quality in the Ottawa River*** = Rapport du groupe d'étude des sels nutritifs du groupe technique de travail fédéral-provincial sur la qualité de l'eau de la rivière des Outaouais • May 1980 • vi, 106p

This document contains the detailed data analysis for water quality evaluation of the Ottawa River, a summary of findings and some recommendations. Methods employed for water quality evaluations are described, and a discussion on the temporal and spatial variations of phosphorus, nitrogen and dissolved oxygen contents is included. The nutrient loadings are given. In the summary of findings, emphasis is put on the content variations in phosphorus, nitrogen and dissolved oxygen in the different reaches of the river. The recommendations are: the reach of the river

downstream of the National Capital Region should be studied in further detail; an in-depth nutrient loading study should be conducted; reasons for the decrease in dissolved oxygen content should be determined; a monitoring program should be developed to describe the water quality during the implementation of future developments along the river.

701 (066465)
FEDERAL-PROVINCIAL TECHNICAL WORKING GROUP ON WATER QUALITY IN THE OTTAWA RIVER, CONTAMINANTS TASK FORCE * ***Report of the Contaminants Task Force of the Federal/Provincial Technical Working Group on Water Quality in the Ottawa River*** = Rapport du groupe d'étude des contaminants du groupe technique de travail fédéral-provincial sur la qualité de l'eau de la rivière des Outaouais * Apr 1980 * 23p

This report on contaminants in the Ottawa River indicates, after examination of all available data, that a number of localized contaminant problems do exist although the river as a whole shows no sign of unusual contamination. It is found that no problems exist with respect to trace metals contamination; PCBs are present in the river ecosystem; although no problem exists for acid rain from Lake Timiskaming to the south, the status of the Ottawa River north of the lake is at present undetermined; and no problem presently exists with respect to radionuclide contamination of the river. Data on the presence of trace metals and persistent organic contaminants in water, sediments, biota and fish are presented. A brief account on the effects of acid rain on the Ottawa River Basin is also included.

702 (F14614)
GROUPE TECHNIQUE DE TRAVAIL FÉDÉRAL-PROVINCIAL SUR LA QUALITÉ DE L'EAU DE LA RIVIÈRE DES OUTAOUAIS * ***Rapport du groupe d'étude des contaminants*** = Report of the contaminants task force * Environnement Canada; Ministère de l'Environnement de l'Ontario; Ministère de l'Environnement du Québec * avril 1980 * vi, 24p

L'examen des données disponibles relatives aux contaminants de l'écosystème de l'Outaouais a révélé l'existence d'un certain nombre de problèmes de contamination. La rivière n'a donné aucun signe de contamination exceptionnel dans son ensemble. Les substances étudiées jusqu'à présent sont: métaux à l'état de traces, BPC et contaminants organiques, radionucléides et autres. Ce rapport a pour objectif global de faire le point des connaissances actuelles relatives à la qualité des eaux de la rivière des Outaouais. Le mandat particulier du Groupe d'étude des contaminants est d'examiner les données du passé, d'effectuer l'analyse et l'interprétation des données, de mettre en lumière les problèmes liés aux contaminants et de déceler les lacunes dans le corps des données.

703 (F14613)
GROUPE TECHNIQUE DE TRAVAIL FÉDÉRAL-PROVINCIAL SUR LA QUALITÉ DE L'EAU DE LA RIVIÈRE DES OUTAOUAIS * ***Rapport du groupe d'étude du plan de surveillance*** = Report of the monitoring plan task force * Environnement Canada; Ministère de l'Environnement de l'Ontario; Ministère de l'Environnement du Québec * sept 1981 * vi, 30p

La rivière des Outaouais représente le plus gros tributaire du Saint-Laurent avec son bassin versant de plus de 146 000 km², dont 63 % se trouvent au Québec et 37 % en Ontario. Le groupe d'étude était chargé d'établir un plan de surveillance continue en vue d'obtenir une évaluation suivie de l'état de l'eau dans la partie interprovinciale de la rivière des Outaouais et d'obtenir des données afin de déterminer les divers effets que subit ce cours d'eau et d'aider à la gestion de cette ressource. Le présent plan a pour but de déterminer de façon détaillée, coordonnée et économique les répercussions des activités humaines sur la qualité de l'écosystème que représente la rivière. On y décrit l'effort minimum qu'il faudra déployer pour atteindre les objectifs suivants: déterminer la qualité actuelle de l'eau, identifier les zones problèmes, aider les gestionnaires à élaborer et à mettre en oeuvre des correctifs, et déterminer les tendances de la qualité de l'eau. L'Ontario et le Québec possèdent un modèle pour estimer les apports de sources diffuses. On recommande d'évaluer ces deux modèles et d'en choisir un pour l'étude.

704 (066464)
FEDERAL-PROVINCIAL TECHNICAL WORKING GROUP ON WATER QUALITY IN THE OTTAWA RIVER * ***Report of the Federal-Provincial Technical Working Group on Water Quality in the Ottawa River*** = Rapport du groupe technique de travail fédéral-provincial sur la qualité de l'eau de la rivière des Outaouais * Oct 1981 * 29p

The Federal-Provincial Technical Working Group on Water Quality in the Ottawa River reviewed nutrients, contaminants and bacteriology as they impact on the water quality conditions of the river. Although no major problems were discovered, deterioration of water quality in localized areas was recognized. In many instances, however, a lack of consistent, reliable data made it impossible to reach a definite conclusion as to the presence and significance of some contaminants. Significant decreases in phosphorus concentrations between 1972 and 1976 were recorded, due in large part to the effect of detergent phosphate limitations and to phosphorus removal in Ontario sewage treatment plants. Dissolved oxygen concentrations are generally acceptable. There have been decreases with time at Carillon and particularly at the Otto Holden Station. The rather sparse data on the trace metals and organics did not reveal any serious problems other than the well-documented presence of mercury, which appears to be slowly diminishing, and possible elevated levels of PCBs downstream of Ottawa. There is bacteriological contamination in the Ottawa region due to municipal discharges and urban storm water runoff. Generally, the bacteriological quality is better in midstream than in near shore areas. The evaluation of the water quality

was hampered by gaps and inconsistencies in the data, due to a lack of coordination of monitoring programs and the recent discontinuation of some of the monitoring. The working group recommends that a coordinating committee be established, with representation from the governments of Canada, Quebec and Ontario. The committee would be responsible for reviewing data needs and overseeing the implementation of a coordinated monitoring plan in accordance with the available resources of the three agencies and would report annually to the Environment ministers of the three governments. The working group also recommends that dissolved oxygen monitoring be reviewed on a priority basis, that pollution abatement efforts be continued with emphasis on biochemical oxygen demand reduction, and that the effects of agricultural inputs be evaluated in a special study.

705 (F14615)
GROUPE TECHNIQUE DE TRAVAIL FÉDÉRAL-PROVINCIAL SUR LA QUALITÉ DE L'EAU DE LA RIVIÈRE DES OUTAOUAIS * ***Rapport du groupe technique de travail fédéral-provincial sur la qualité de l'eau de la rivière des Outaouais*** = Report of the Federal-Provincial Technical Working Group on Water Quality in the Ottawa River * Environnement Canada; Ministère de l'Environnement du Québec; Ministère de l'Environnement de l'Ontario * oct 1981 * 31p

Le Groupe technique de travail fédéral-provincial sur la qualité de l'eau de la rivière des Outaouais a étudié l'incidence des sels nutritifs, des polluants et de la bactériologie sur la qualité de l'eau de la rivière. Bien que l'on n'ait décelé aucun problème majeur, on a constaté une détérioration de la qualité de l'eau dans certains secteurs. Entre 1972 et 1976, les concentrations de phosphore ont diminué de façon importante grâce, en grande partie, à la limitation du phosphate dans les détergents et à la déphosphorisation effectuée dans les usines ontariennes d'épuration des eaux d'égout. Les concentrations d'azote varient grandement tout au long de la rivière, mais aucune tendance générale par rapport au temps n'a pu être observée. Les concentrations d'oxygène dissous sont généralement acceptables. Mis à part le mercure, les données plutôt éparses sur les métaux à l'état de trace et les matières organiques n'ont révélé aucun problème grave. Il y a contamination bactériologique dans la région d'Ottawa en raison de la pollution municipale et des autres activités urbaines. Bien que la rivière des Outaouais ait un effet tampon plutôt bas et qu'elle soit exposée ainsi à la dégradation par les pluies acides, les données existantes n'indiquent aucune détérioration appréciable.

706 (066466)
FEDERAL-PROVINCIAL TECHNICAL WORKING GROUP ON WATER QUALITY IN THE OTTAWA RIVER, MONITORING TASK FORCE * ***Report of the Monitoring Plan Task Force of the Federal/Provincial Technical Working Group on Water Quality in the Ottawa River*** = Rapport du groupe d'étude du plan de surveillance du groupe technique de travail fédéral-provincial sur la qualité de l'eau de la rivière des Outaouais * Sept 1981 * 24p

A monitoring plan which presents a basic framework for monitoring activities and is designed to provide the required information for the proper assessment of the water quality of the Ottawa River, is described. The plan presented determines the impact of man's activities on the quality of the river ecosystem in a coordinated and cost-effective manner which is required to meet the following objectives: determine existing water quality conditions; identify problem areas; assist managers in the design and implementation of remedial programs; and determine water quality trends. The plan is carried out on the interprovincial section of the river between Notre-Dame-du-Nord and Carillon and is comprised of the following components: main stem (water, sediment and fish); and inputs (tributaries, municipal, industrial, and non-point sources). Sampling locations, frequencies and procedures, the use of standard methods of analyses, quality control programs and conformance in data storage, retrieval, verification, analyses and utilization, are included in the program.

12. ATLANTIC COASTAL REGION / RÉGION CÔTIÈRE DE L'ATLANTIQUE

12.1 Saint John River Basin / Bassin du fleuve Saint-Jean

Final report / Rapport définitif

707 (F06351)
COMMISSION DU BASSIN DU FLEUVE SAINT-JEAN * ***Plan de la gestion de l'eau dans le bassin du fleuve Saint-Jean, Rapport final ... Première partie, Ressource en eau et utilisation de l'eau*** * Ministère de l'Environnement du Nouveau-Brunswick, Fredericton, NB * avril 1975 * 279p

Cette première partie du rapport de la Commission du bassin du fleuve Saint-Jean renferme les données concrètes sur lesquelles repose le plan de gestion de l'eau du bassin. Elle décrit les caractéristiques du bassin, les données démographiques et économiques, l'abondance de l'eau et sa qualité. Elle traite également de l'écologie du bassin et donne les détails concernant les exigences actuelles et futures des neuf principaux secteurs d'utilisation de l'eau.

708 (026840)
SAINT JOHN RIVER BASIN BOARD • ***Plan for water management in the Saint John River Basin, final report of the Saint John River Basin Board, part 1, water resources and water use*** • Saint John River Basin Board, Fredericton, NB • Apr 1975 • 262p

This report presents the results of comprehensive planning studies done as a result of an awareness of the need for planning development and management of the water resources of the Saint John River Basin. The study done in consultation with the public made several recommendations for improved control and management of the Saint John River Basin. In addition to the proposed recommendations, the report contains information on the physical settling, the inhabitants of the basin, the economics of the basin, the availability of water and its quality, the aquatic ecology and water use. The chapter dealing with water use gives details of the agriculture, forestry, fisheries, wildlife, mining, tourism and recreation, industry, municipalities and power generation aspects of the water utilization.

709 (F06064)
COMMISSION DU BASSIN DU FLEUVE SAINT-JEAN • ***Plan de la gestion de l'eau dans le bassin du fleuve Saint-Jean, rapport final de la Commission du bassin du fleuve Saint-Jean, deuxième partie, étude de la gestion de l'eau*** • Ministère de l'Environnement du Nouveau-Brunswick, Fredericton, NB • avril 1975 • 124p

Cette deuxième partie du rapport de la Commission analyse les problèmes de la gestion des eaux du bassin selon les points de vue de la population, de scientifiques et de l'équipe de planification de la Commission. Cette analyse est précédée de descriptions et de commentaires portant sur le cadre juridique et institutionnel. La dernière tranche souligne une méthodologie de prise de décision conçue pour faciliter l'évaluation des diverses possibilités de l'eau.

710 (026839)
SAINT JOHN RIVER BASIN BOARD • ***Plan for water management in the Saint John River Basin, report of the Saint John River Basin Board, part 2 water management considerations*** • Saint John River Basin Board, Fredericton, NB • Apr 1975 • 115p

This report, part 2 of the Saint John Basin Study, examines the present water management framework, its related problems and the approaches to their resolution. The water management considerations comprise the legal and institutional factors within which the plan must operate, the water management problems and opportunities as perceived by the public, by specialists in particular water-related fields and by planners and also the proposed methods for setting priorities and evaluating options. Included in the scope for management analysis is information regarding floods and methods of dealing with them, pollution problems, waste treatments, problems of erosion as well as the use of scientific data such as hydro-meteorological and economic data.

711 (F06352)
COMMISSION DU BASSIN DU FLEUVE SAINT-JEAN • ***Plan de la gestion de l'eau dans le bassin du fleuve Saint-Jean, Rapport final de la Commission du basin du fleuve Saint-Jean, Troisième partie, Cadre administratif de gestion*** • Ministère de l'Environnement du Nouveau-Brunswick, Fredericton, NB • avril 1975 • 259p

Ce troisième rapport de la Commission du fleuve Saint-Jean traite des hypothèses possibles et souhaitables d'utilisation et de gestion de l'eau. Il renferme les directives à suivre dans le processus de prise de décision quant aux normes de quantité et de qualité de l'eau. Il analyse les différents modes de gestion et souligne les raisons qui ont motivé les choix de la Commission. Enfin, il renferme les recommandations de la Commission et précise les procédures de mise en oeuvre et les répercussions financières des programmes et projets de gestion des eaux.

712 (026838)
SAINT JOHN RIVER BASIN BOARD • ***Plan for water management in the Saint John River Basin, report of the Saint John River Basin Board, part 3 a framework for management*** • Saint John River Basin Board, Fredericton, NB • Apr 1975 • 246p

This report presents part 3 of the results of the Saint John River Basin Board's studies. This report describes the plan as well as the planning process. It presents water management options such as target populations and their water requirements, possible water management use objectives for each economic sector as well as a set of management objectives that will permit resource management in the interest of all sectors, and finally, alternative courses of action for meeting the objectives. The report also provides guidelines for decision-making in areas of water quality and quantity, availability, constraints on use and unit costs for meeting objectives. Recommendations for the framework for management, programs and projects for the future and implementation of the plan are included in the final chapters.

Summary report / Sommaire

713 (F06350)
COMMISSION DU BASSIN DU FLEUVE SAINT-JEAN • ***Plan de gestion de l'eau dans le bassin du fleuve Saint-Jean, rapport de la Commission du bassin du fleuve Saint-Jean, sommaire*** • Ministère de l'Environnement du Nouveau-Brunswick, Fredericton, NB • avril 1975 • 102p

Ce document de la Commission du fleuve Saint-Jean, mise sur pied à la suite d'une entente fédérale-provinciale en 1970, présente l'historique et l'élaboration d'un plan provisoire de la qualité de l'eau du bassin, le cadre administratif de ce plan et les recommandations que la Commission a formulées à la

suite des nombreuses consultations; ces recommandations sont présentées en deux parties: recommandations aux usagers de l'eau et recommandations aux administrateurs de l'eau. Le document fournit les données de mise en application de ce plan et les dépenses et avantages prévus à cet effet.

714 (026837)
SAINT JOHN RIVER BASIN BOARD • ***Plan for water management in the Saint John River Basin, report of the Saint John River Basin Board, summary*** • Saint John River Basin Board, Fredericton, NB • Apr 1975 • 98p

The summary of the Saint John River Basin Study presents the most salient characteristics of the Saint John River Basin and highlights its water management problems. The essential elements of the water management plan are identified as are the key factors in its development. The report also contains the recommendations of the Saint John River Basin Board to the water users and managers.

715 (069291)
PETER MCLOUGHLIN ASSOCIATES LTD. • ***Economic trends in the Saint John River Basin*** • The Saint John River Basin Board, Fredericton, NB • May 1974 • 28p • (The Saint John River Basin Board summary report, no S1)

This report represents a summary of an extensive economic study submitted to the Saint John River Basin Board entitled Population and Economic Trends in the Saint John River Basin. This summary describes the past, present and projected future of the basin population, labor force and employed labor force. The data are presented both with respect to the five planning regions of the basin and to the major production sectors of the basin economy (agriculture, forestry, fisheries and trapping, mining, manufacturing, construction and services). The value of Gross Basin Product is reported and future projections are made on the basis of planning regions and production sectors.

716 (F04075)
PETER MCLOUGHLIN ASSOCIATES LTD. • ***Tendances économiques du bassin du fleuve Saint-Jean*** • Commission du bassin du fleuve Saint-Jean, Fredericton, Nouveau-Brunswick • mai 1974 • 28p • (Commission du bassin du fleuve Saint-Jean, rapport C-1)

Ce document, divisé en trois parties, résume une étude économique approfondie du bassin du fleuve Saint-Jean. La première partie nous donne un bref historique de la population et de la force ouvrière du bassin, suivi de quelques perspectives d'avenir. On présente des données touchant à la fois les cinq régions de planification et les principaux secteurs économiques (les services, l'exploitation agricole, minière, forestière et manufacturière, la pêche et la construction). La deuxième partie traite de la valeur du produit brut du bassin. On retrouve aussi quelques projections d'avenir, basées sur les secteurs de production des différentes régions de planification. Enfin, dans la dernière partie, on identifie les principaux résultats de cette étude.

717 (069292)
DEPARTMENT OF THE ENVIRONMENT, INLAND WATERS DIRECTORATE • ***The water resources of the Saint John River Basin*** • The Saint John River Basin Board, Fredericton, NB • Feb 1972 • 8p • (The Saint John River Basin Board summary report, no S2)

This report discusses aspects of streamflow in the Saint John River and its tributaries. The climate, physiography and drainage system of the Saint John River Basin are described and average yearly runoff is given. Similarities are noted between the patterns of runoff and precipitation in the Saint John River Basin and seasonal variations of streamflow are discussed. The effects of storage reservoirs and specific land use, such as forestry and agriculture, on streamflow in the basin are briefly examined.

718 (F03819)
MINISTÈRE DE L'ENVIRONNEMENT, DIRECTION DES EAUX INTÉRIEURES • ***Les ressources en eau du bassin du fleuve Saint-Jean*** • Commission du bassin du fleuve Saint-Jean, Fredericton, Nouveau-Brunswick • févr 1972 • 9p • (Commission du bassin du fleuve Saint-Jean, rapport C-2)

Ce rapport s'intéresse particulièrement à l'écoulement du fleuve Saint-Jean et de ses tributaires. Le bassin du fleuve est décrit relativement aux aspects du climat, de la physiographie et du drainage. Le ruissellement du bassin du fleuve et les variations saisonnières de l'écoulement sont évalués. L'influence des bassins de retenue et l'influence de l'utilisation des terres sur le débit du fleuve sont finalement déterminées.

719 (018408)
DEPARTMENT OF THE ENVIRONMENT, INLAND WATERS DIRECTORATE • ***Floods in the Saint John River Basin*** • Saint John River Basin Board, Fredericton, NB • Aug 1972 • 14p • (Saint John River Basin Board summary report, no S3)

Flooding is a natural feature of the Saint John River Basin and flood reports still in existence trace the history of flooding back almost 300 years, and no doubt long before that time serious floods occurred. This report examines various aspects of floods in the basin. Topics examined include causes of flooding, flood damage and ways of reducing flood problems.

720 (F03812)
MINISTÈRE DE L'ENVIRONNEMENT, DIRECTION DES EAUX INTÉRIEURES • ***Inondations dans le bassin du fleuve Saint-Jean*** • Commission du bassin du fleuve Saint-Jean, Fredericton, Nouveau-Brunswick • août 1972 • 16p • (Commission du bassin du fleuve Saint-Jean, rapport C-3)

Les inondations constituent une caractéristique naturelle du bassin du fleuve Saint-Jean. Ce document en étudie les causes climatiques, les dégâts qui en

résultent (dommages immédiats, indirects et non matériels) et les moyens de réduire les problèmes causés par les inondations; ceux-ci comprennent la répression des inondations, la réglementation des terrains inondables et la modification aux constructions, les avertissements d'inondation et les mesures d'urgence, ainsi qu'une meilleure répartition dans la compensation des pertes.

721 (018407)
MONTREAL ENGINEERING COMPANY LTD. * ***Water use for agriculture*** * Saint John River Basin Board, Fredericton, NB * Nov 1973 * 46p * (Saint John River Basin Board summary report, no S5)

This report examines water use for agriculture in the Saint John River Basin. The relationships between agriculture in New Brunswick and the water resources of the Saint John River Basin are many and varied, and conflicts have arisen. First of all, pesticides, herbicides, lime and fertilizers, sediments, and farm and industrial wastes all modify water quality. Secondly the water quality problems that do exist originate in activity both on the farm and off the farm. Thirdly the future of the agriculture-water resource interface will depend very much upon the market situations which will prevail. In any event, a number of water management problems do exist in relation to agriculture which could intensify and which even at their present levels pose a threat to water quality in the basin.

722 (F03818)
MONTREAL ENGINEERING COMPANY LTD. * ***Utilisation de l'eau en agriculture dans le bassin du fleuve Saint-Jean*** * Commission du bassin du fleuve Saint-Jean, Fredericton, Nouveau-Brunswick * nov 1973 * 48p * (Commission du bassin du fleuve Saint-Jean, rapport C-5)

Ce rapport étudie les relations entre l'agriculture et les ressources en eau dans le bassin du fleuve Saint-Jean. Les conditions climatiques et les conditions du sol relatives à l'agriculture sont d'abord décrites. La production, l'exploitation agricole et l'industrie de transformation des produits agricoles sont analysées et leur impact sur les ressources en eau est évalué. La population agricole est étudiée et le rapport se termine par une étude de marché portant sur la production.

723 (069293)
SEHEULT, L.R. * ***Water use in the forest industries in the Saint John River Basin*** * The Saint John River Basin Board, Fredericton, NB * June 1974 * 21p * (The Saint John River Basin Board summary report, no S6)

Water use in the forest industries is summarized for the Saint John River Basin. Present forest resources of the basin are described as well as ownership and use of the forest lands. Statistics are presented on employment in the forest industries and forestry in the basin and effects of forestry operations on water resources are examined. The requirements and use of water by the forest industry are summarized.

724 (F03817)
SEHEULT, L.R. * ***Utilisation de l'eau par l'industrie forestière dans le bassin du fleuve Saint-Jean*** * Commission du bassin du fleuve Saint-Jean, Fredericton, Nouveau-Brunswick * juin 1974 * 22p * (Commission du bassin du fleuve Saint-Jean, rapport C-6)

Ce document décrit les ressources forestières du bassin du fleuve Saint-Jean et la situation relative à l'exploitation forestière. Il aborde les aspects suivants: la production de la forêt et son utilisation, l'industrie du sciage et de la pâte à papier, l'emploi dans ce secteur, les effets des activités forestières sur les ressources en eau, la demande et l'utilisation de l'eau par cette industrie.

725 (018211)
METH, F.F. * ***Fisheries in the Saint John River Basin*** * Saint John River Basin Board, Fredericton, NB * Nov 1973 * 25p * (Saint John River Basin Board summary report, no S7)

The Saint John River Basin, including the main stem and its tributaries, consists of three distinct regions: the estuary, which extends from the mouth of the Saint John to McKinley Ferry, just below the Mactaquac Dam; the middle basin, which extends upstream from McKinley Ferry to the cataract at Grand Falls; and the upper basin, which is the region from Grand Falls to the headwaters. This report reviews the existing and potential fisheries, both recreational and commercial, and the management exercised over them. It also presents extracts from surveys made in 1971-72, and the results of some sampling of freshwater fish for mercury contamination.

726 (F03816)
METH, F.F. * ***Utilisation de l'eau pour la pêche dans le bassin du fleuve Saint-Jean*** * Commission du bassin du fleuve Saint-Jéan, Fredericton, Nouveau-Brunswick * nov 1973 * 27p * (Commission du bassin du fleuve Saint-Jean, rapport C-7)

Ce rapport décrit les utilisations antérieures, actuelles et futures, à la fois sportives et commerciales, des ressources piscicoles du bassin du fleuve Saint-Jean. Les possibilités d'élevage du saumon de l'Atlantique dans les tributaires sont évaluées. Les mesures législatives et administratives relatives aux eaux et à la pêche sont finalement étudiées.

727 (018217)
CHOATE, J.S. * ***Water use for wildlife in the Saint John River Basin*** * Saint John River Basin Board, Fredericton, NB * Nov 1973 * 65p * (Saint John River Basin Board summary report, no S8)

The wildlife resources study was conducted from May 1971 to October 1972. Its overall objective was to accumulate basic information on the wildlife of the Saint John River Basin and present it to the board for integration into its planning process so that these resources could be maintained and managed for man's use and benefit. The study encompassed wildlife

habitat and uses of the resources in the basin, with emphasis on those species, along the main stem and the adjacent aquatic habitat, most closely associated with water.

728 (F03815)
CHOATE, J.S. * ***Utilisation de l'eau par la faune dans le bassin du fleuve Saint-Jean*** * Commission du bassin du fleuve Saint-Jean, Fredericton, Nouveau-Brunswick * nov 1973 * 67p * (Commission du bassin du fleuve Saint-Jean, rapport C-8)

Un inventaire des ressources fauniques du bassin du fleuve Saint-Jean a été effectué en 1971-1972. La première partie du rapport décrit la faune et son habitat, principalement en ce qui concerne le milieu aquatique; les facteurs humains ayant des répercussions sur ces habitats, la faune qui y vit et son utilisation sont aussi décrits. La deuxième partie du rapport tente de fournir des renseignements sur l'utilisation des ressources fauniques ainsi que sur les valeurs accordées à ces utilisations par la population et les impacts économiques subséquents. Finalement, des recommandations sont formulées pour l'habitat des terres humides et de la vie aquatique en ce qui a trait à la gestion des eaux.

729 (018218)
MONTREAL ENGINEERING COMPANY LTD.; RESOURCE ASSOCIATES LTD. * ***Water use for mineral development in the Saint John River Basin*** * Saint John River Basin Board, Fredericton, NB * Nov 1973 * 22p * (Saint John River Basin Board summary report, no S9)

This report examines water use for mineral development in the Saint John River Basin. Aspects of the topic considered include mineral prospects and potential, existing mineral developments and potential mineral activity. It is concluded that mineral development within the Saint John River Basin does not at present have a major impact on either the environmental or water allocation aspects of water management, and estimates of the water demands and environmental impact of potential developments are impossible at this stage.

730 (F03814)
MONTREAL ENGINEERING COMPANY LTD.; RESOURCE ASSOCIATES LTD. * ***Utilisation de l'eau dans l'expansion minière du bassin du fleuve Saint-Jean*** * Commission du bassin du fleuve Saint-Jean, Fredericton, Nouveau-Brunswick * nov 1973 * 24p * (Commission du bassin du fleuve Saint-Jean, rapport C-9)

Ce document fait l'inventaire des possibilités minières du bassin du fleuve Saint-Jean et dont l'exploitation peut avoir un impact sur la gestion des eaux du bassin. Étant donnée la grande variété de minéraux et de structures, la région a été divisée en six zones. Les aménagements miniers actuels sont décrits, particulièrement en regard de l'utilisation de l'eau. Les nouvelles possibilités d'exploitation minière en regard de leurs répercussions sur la gestion de l'eau sont étudiées.

731 (069294)
HUSTINS, D.G. * ***Water use for outdoor recreation in the Saint John River Basin*** * The Saint John River Basin Board, Fredericton, NB * Nov 1973 * 27p * (The Saint John River Basin Board summary report, no S10)

This report analyzes and evaluates the present and potential outdoor recreational resources of the Saint John River Basin. The present study and use of outdoor recreational resources are discussed and land capability for outdoor recreation is investigated. The present status of tourism is described and the effects of water pollution on water-oriented recreational activities are examined. A tourism plan is outlined which will establish a new system of tourist regions, destination areas and circulation corridors. The most serious limitations on the future recreational use of water resources of the Saint John River Basin are impairment of water quality; reduction in the quantity of available recreation water; and conflicts between recreational use and economic interest. The usefulness of water for outdoor recreation in the basin hinges on three factors: proximity to populations; physical and legal accessibility; and suitability for recreational purposes. To meet this criteria, twelve brief recommendations are presented.

732 (F03809)
HUSTINS, D.G. * ***Utilisation de l'eau pour les loisirs en plein air dans le bassin du fleuve Saint-Jean*** * Commission du bassin du fleuve Saint-Jean, Fredericton, Nouveau-Brunswick * nov 1973 * 30p * (Commission du bassin du fleuve Saint-Jean, rapport C-10)

Les ressources récréatives actuelles et potentielles du bassin du fleuve Saint-Jean sont analysées et évaluées, de façon à mieux assurer la protection et l'aménagement des ressources en eau du bassin. Après l'inventaire des ressources récréatives de plein air, on identifie les tendances de l'utilisation actuelle des installations récréatives ainsi que l'offre et la facilité d'accès de ces installations. La situation actuelle du tourisme est ensuite évaluée. Les effets de la qualité de l'eau sur les différents types de loisirs sont analysés et des mesures de restriction sur les usages récréatifs sont apportées. Finalement, des recommandations relatives à l'utilisation de l'eau pour les loisirs de plein air sont formulées.

733 (018220)
LEWELL, P.A. * ***Water use for the potato starch industry in the Saint John River Basin*** * Saint John River Basin Board, Fredericton, NB * Nov 1973 * 15p * (Saint John River Basin Board summary report, no S11)

This report investigates water use for the potato starch industry in the Saint John River Basin. Aspects of the subject examined include world starch production and consumption, the Canadian situation, potato starch production in Canada, the market for potato starch in Canada and potato starch manufacturing in New Brunswick. The report concludes that the

outlook for the industry at this time is uncertain; at best, it may continue as a marginal enterprise.

734 (F03810)
LEWELL, P.A. * ***Utilisation de l'eau par l'industrie de la fécule de pomme de terre du bassin du fleuve Saint-Jean*** * Commission du bassin du fleuve Saint-Jean, Fredericton, Nouveau-Brunswick * nov 1973 * (Commission du bassin du fleuve Saint-Jean, rapport C-11)

Cette étude vise à faire le point sur l'avenir de l'industrie de la fécule de pomme de terre et à servir à évaluer les problèmes que peut soulever cette industrie dans les domaines de la gestion des eaux et de la gestion des déchets. La situation de la production de la fécule est décrite aux niveaux mondial, national et provincial. Au niveau national, le marché de la fécule est étudié sous l'angle de la commercialisation, de l'offre et de la demande et des prévisions du marché. Au niveau provincial, les aspects de la production concernant l'approvisionnement, la fabrication, les programmes de subvention et la production d'eaux usées sont étudiés.

735 (069295)
PETER MCLOUGHLIN ASSOCIATES LTD. * ***Water use for manufacturing in the Saint John River Basin*** * The Saint John River Basin Board, Fredericton, NB * June 1974 * 21p * (The Saint John River Basin Board summary report, no S12)

This report provides an assessment of the non-resource-based manufacturing industry and its role in the basin economy, and identifies the relationship of the non-resource-based manufacturing industry of New Brunswick and relates it to Canada as a whole. The manufacturing industries of the Saint John River Basin are examined in detail on a county-by-county basis and the role of manufacturing in the five planning regions on the basin is evaluated by measuring value added.

736 (F04074)
PETER MCLOUGHLIN ASSOCIATES LTD. * ***Utilisation de l'eau par l'industrie manufacturière du bassin du fleuve Saint-Jean*** * Commission du bassin du fleuve Saint-Jean, Fredericton, Nouveau-Brunswick * juin 1974 * 22p * (Commission du bassin du fleuve Saint-Jean, rapport C-12)

Les buts de ce rapport sont d'évaluer l'industrie manufacturière de non-ressources et son rôle dans l'économie du bassin et d'établir la relation entre l'industrie manufacturière de non-ressources et les ressources en eaux du bassin. La première tentative du rapport a été de considérer l'industrie manufacturière globale du Nouveau-Brunswick en rapport avec celle du Canada. L'industrie du Nouveau-Brunswick est ensuite étudiée en détail, suivie par un coup d'oeil sur l'industrie manufacturière du bassin du fleuve Saint-Jean, comté par comté. Par la suite, le rôle de l'industrie manufacturière des cinq régions de planification adoptées par la Commission du bassin du fleuve est examiné en mesurant la valeur ajoutée. Ensuite, le secteur manufacturier de non-ressources du bassin est abordé grâce aux données sur l'embauche fournies par la Commission des accidents du travail du Nouveau-Brunswick. Enfin, les réflexions sur la gestion des eaux sont évaluées.

737 (069296)
Water use and aquatic ecology in the Saint John River Basin * The Saint John River Basin Board, Fredericton, NB * Sept 1974 * 36p * (The Saint John River Basin Board Summary report, no S15)

A study of the aquatic ecology in the main stem of the Saint John River was carried out to provide an indication of what the basin can produce in terms of fish and wildlife and to assess the effects of man's activities on the natural resource potential of the system. The study concentrated on the head ponds of the Saint John River and the Tobique River as they are receiving the brunt of the industrial effluents. This report briefly describes the physical and chemical conditions of the Tobique, Mactaquac, Beechwood and Grand Falls headponds and outlines the year-long field sampling program of the headpond ecology. Nutrient cycles, loadings and concentration are described and statistics are given on the distribution of phytoplankton, zooplankton and macrobenthos. Finally, consideration is given to the impact of herring on zooplankton.

738 (F03813)
WATT, W.D.; DUERDEN, F.C. * ***Utilisation et écologie de l'eau*** * Commission du bassin du fleuve Saint-Jean, Fredericton, Nouveau-Brunswick * sept 1974 * 41p * (Commission du bassin du fleuve Saint-Jean, rapport C-15)

Les lacs artificiels sont en partie responsables des problèmes relatifs à la qualité de l'eau et à l'écologie aquatique dans le fleuve Saint-Jean. Ce rapport étudie l'écologie aquatique des lacs artificiels du bassin du fleuve Saint-Jean et de la rivière Tobique; il étudie plus spécifiquement le rôle des conditions physiques et des différentes catégories d'organismes vivants dans l'écologie aquatique du bassin. Un programme d'échantillonnage effectuant des relevés à chaque mois a permis d'observer les variations saisonnières des matières nutritives présentes, la productivité en phytoplancton, la distribution du zooplancton et du macrobenthos. L'action du hareng sur le zooplancton a aussi été évaluée.

739 (069297)
KEACHIE, P.M.; CÔTÉ, R.P. * ***Water use and toxic pollutants in the Saint John River Basin*** * The Saint John River Basin Board, Fredericton, NB * Mar 1974 * 35p * (The Saint John River Basin Board summary report, no S16)

This study of toxic pollutants occurring in the Saint John River Basin presents information currently available from analyses of the water, sediments and living organisms. Biologically significant concentrations of toxic pollutants in the Saint John River result mainly from agricultural and industrial activities. Introduced toxic materials include chlorinated hydrocarbons, organo-phosphorus and carbamate pesticides,

herbicides, fungicides, heavy metals and the toxic components of industrial effluents, primarily from pulp and paper mills. The chemical characteristics and biological effects of these materials are reviewed and information is presented on their distribution in water, sediments and biological material.

740 (F03811)
KEACHIE, P.M.; CÔTÉ, R.P. * ***Utilisation de l'eau et les polluants toxiques dans le bassin du fleuve Saint-Jean*** * Commission du bassin du fleuve Saint-Jean, Fredericton, Nouveau-Brunswick * mars 1974 * 39p * (Commission du bassin du fleuve Saint-Jean, rapport C-16)

Cette étude dresse l'inventaire des polluants toxiques retrouvés dans les eaux du bassin du fleuve Saint-Jean. Elle se base sur un échantillonnage et sur l'étude des documents touchant les sources, les caractéristiques chimiques et les effets biologiques des éléments toxiques susceptibles de pénétrer dans le bassin. Après une description des caractéristiques chimiques et des effets biologiques des toxines, les sources de pollution sont analysées pour les différentes catégories de polluants toxiques; ces renseignements proviennent d'analyses de l'eau, de sédiments et d'organismes vivants.

Miscellaneous reports / Rapports divers

741 (069315)
Briefing notes spring 1973 : Saint John River Basin Board = Renseignements tactiques printemps 1983 : la Commission du bassin du fleuve Saint-Jean * Saint John River Basin Board * 1973? * 22p

On June 30, 1970, the governments of Canada and New Brunswick signed the Saint John River Basin Agreement which set up the Saint John River Basin Board to carry out scientific studies to ascertain the desires of the inhabitants of the Saint John River Basin concerning the use of the water resource. An interim plan was produced for dealing with more conspicuous pollution problems, one of the most obvious being the effluent being poured into the waterways by major industries and communities. It called for action by major industries and communities in the basin to install pollution control systems, as well as for discussions with American officials regarding pollution entering the basin in Maine, and for the enforcement of laws already in existence regarding water resources at the three levels of government. Not all of the deadlines set under the interim plan have been met; however, much progress has been made. Concerned citizens are urged to be part of each step of the process of planning for the use of the water resources of the Saint John River Basin, by being aware of existing problems and by becoming involved with others in the community facing pollution problems.

742 (014844)
INLAND WATERS DIRECTORATE, ATLANTIC REGION * ***New Brunswick flood, April - May 1973*** * Environment Canada, Inland Waters Directorate, Ottawa, Ont * (1973) * 114p * (Technical bulletin, no 81)

During the latter part of April and early part of May 1973, extreme flood conditions occurred in most parts of New Brunswick. These conditions were caused by rainfall combined with heavy snowmelt. The most seriously affected part of the province was the flood plain of the lower Saint John River in the Fredericton area and in the agricultural lands a few miles downstream of Fredericton. Damages in these two areas accounted for about 60% of the total economic cost of the flood. During the 1973 flood, forecasting and emergency measures activities were successful in avoiding more serious personal hardship and greater economic losses. Warning provided, through weather and streamflow forecasting, permitted some advance planning to react to the emergency while the emergency measures organization proved its worth in directing the disaster activities. In spite of this, the flood caused an estimated $2.5 million in damage to moveable property. Continuation and improvement of flood forecasting and emergency measures programs are clearly desirable.

743 (069285)
Interim plan for water resource and water quality management * The Saint John River Basin Planning Committee, Fredericton, NB * Oct 1970 * vp

This document consists of two parts: background information to the Saint John River Basin Agreement Interim Plan for Water Resource and Water Quality Management, which assesses the present water quality in the basin and outlines the interim water quality management plan; and the Interim Report on Water Resource and Water Quality Management, which provides the guidelines for an implementation plan. A brief description is given of the Saint John River Basin as well as the existing water pollution problems and pollution control measures presently in effect. Five recommendations for priority action are given, four of which require the construction of various types of pollution control works. Time estimates are given as well as cost estimates for municipal works. A review is given of present legislation which applies to water resources in the basin. This includes the Ashburton-Webster Treaty, 1842, The Boundary Water Treaty, 1909, and federal and provincial statutes. Factual data on water quality are presented in two appendices, while a third appendix lists some of the main statuatory powers of Canada and New Brunswick which pertain to water.

744 (069314)
New life for the Saint John : a choice for its people = Le renouveau du fleuve Saint-Jean : un plan d'action pour sa population * The Saint John River Basin Board, Fredericton, NB * 1971 * 6p

This report describes the growing water pollution problems that led to the establishment of the Saint John River Basin Board and outlines the program it has been developing to reduce pollution and maximize use of the basin's water resources. An interim plan by the Board recommended waste treatment by industries and municipalities that have been disposing wastes directly into the river. As well, discussions are taking place between Canada and the United States on the reduction of waste discharges from communities in Maine into the Saint John and its tributaries. As part of the planning process for the Saint John River Basin, the Board is encouraging public participation by ensuring that citizens are well informed on pollution, flooding, fishing, wildlife, forestry, agriculture, industry and mining, and the costs and methods of water quality control, and by providing them with opportunities for input into the planning process.

745 (F12766)
Le renouveau du fleuve Saint-Jean : un plan d'action pour sa population = New life for the Saint John : a choice for its people * Commission du bassin du fleuve Saint-Jean, Fredericton, NB * 1971 * 7p

Le document brosse d'abord un tableau général du bassin hydrographique du fleuve Saint-Jean, puis discute du niveau de pollution des eaux du fleuve depuis sa source jusqu'à son embouchure. Face à la présence de polluants dans les eaux du fleuve, la Commission recommande un plan d'action et énumère les caractéristiques de ce plan: mandat, objectifs, etc.

746 (069280)
SAINT JOHN RIVER BASIN BOARD, PUBLIC PARTICIPATION SECTION * ***Feed-back on the draft recommendations: a report on the final round of meetings of the regional work groups on the Saint John River Basin Board plan*** * The Saint John River Basin Board, Fredericton, NB * Dec 1974 * 47p

This report presents the views of the regional work groups of the Public Participation Section on the Saint John River Basin Board's draft recommendations as raised and discussed during meetings on the draft version of Chapter 16, the final chapter of the plan for the management of the water resources of the basin. An outline is given of the mandate of the Saint John River Basin Board and the role of the regional work groups. The main points made by the regional work groups as a whole are summarized in Part II of the report, while Part III consists of a detailed presentation made by each group, stemming from an in-depth examination of the minutes of the meetings. An appendix contains a list of members of each regional work group.

747 (007448)
SAINT JOHN RIVER BASIN BOARD * ***Saint John River Basin Board first annual report*** * Saint John River Basin Board * June 1971 * 21p

The report is divided into three main sections, as follows: the Saint John River Basin Agreement outlines the background to the Canada-New Brunswick Agreement; describes the roles of the Board, the Planning Director and the Committee; and outlines the arrangements that exist for implementation and control. Water quality planning and management describes federal and provincial initiatives for early and continuous reduction of pollution through remedial measures applied at the source. Comprehensive planning for optimum resource use describes the longer-term planning program for full utilization of the water resource for the benefit of all. Each section includes a brief statement of progress to date. The main report is supplemented by a number of appendices.

748 (039699)
The Saint John River Basin Board second annual report, June 30, 1972 * Canada-New Brunswick Saint John River Basin Board, Fredericton, NB * June 1972 * 33 P

The Saint John River Basin Agreement calls for a comprehensive all-purpose plan. The broad scope of the study and its challenging need for creativity calls for a planning process carefully designed to meet the requirements of the Canada-New Brunswick Agreement. Four basic principles are inferred from its description of the objectives, terms of reference and scope of the study. They serve as important guidelines in the detailed study design. The four principles are: all possible water uses must be taken into consideration in the planning process; the plan should be sufficiently flexible to allow future leaders to respond to changing needs, and contain provision for its own modification and refinement; the plan should be designed with a definite bias towards the social and economic needs, skills and capabilities of the people of the basin; and implementation of certain elements of the plan cannot wait for its completion but must begin immediately.

749 (039695)
The Saint John River Basin Board third annual report, June 30, 1973 * Canada-New Brunswick Saint John River Basin Board, Fredericton, NB * June 1973 * 19p

The main efforts of the planning office have concentrated on coordinating and managing the study projects, preparing for the evaluation and report preparation stage and working with the public participation section at informing - and learning from - the public. A number of sector study projects have been completed and draft reports submitted to the board. The following are the names of the studies: data system for basin planning and management; the economic outlook for the basin; water quantity studies; water quality studies; agriculture and water management; the forest industry and water management; the fishery resources and water management; the wildlife resource and water management; mineral development and water management; tourism and outdoor recreation in the Saint John River Basin; manufacturing industries and water management; municipalities and water management; electric power and water management; aquatic ecology; and toxic pollution.

750 (018221)
DEPARTMENT OF THE ENVIRONMENT, INLAND WATERS DIRECTORATE * ***Hydrology of the Saint John River Basin*** * Saint John River Basin Board, Fredericton, NB * Dec 1973 * 132p * (Saint John River Basin Board report, no 2)

The hydrology study described in this report was undertaken for the Saint John River Basin Board as a part of a comprehensive investigation to develop a plan for the optimum use of the water resources of the basin. The study was designed to provide general hydrologic information for use in other phases of the board's investigation. Following this introduction, which includes details of the study's terms of reference and general organization, chapter 1 gives a general description of the basin including its climate, physiography and drainage patterns. Chapter 2 consists of a review of the water balance and runoff regime within the basin, together with an examination of the way in which man is influencing this runoff regime, while chapter 3 describes the methodology and results of the streamflow studies. In section 1 of this chapter, the basic hydrometric, physiographic and meteorological data used in these studies are outlined as well as the way in which the data were handled. Section 2 describes the variability of annual, seasonal and monthly streamflow, while section 3 deals with the generation of streamflow sequences. The results of an analysis of the frequency characteristics of floods are described in section 4, and data on low flow frequencies are presented in section 5. Chapter 4 contains the conclusions arising from this study. The appendices to the report contain supplementary information including computer printouts of basic data and results. They will be of particular interest to persons carrying out further studies of the hydrology of the basin.

751 (069275)
DEPARTMENT OF THE ENVIRONMENT, INLAND WATERS DIRECTORATE * ***Hydrology of the Saint John River Basin, appendices*** * Saint John River Basin Board, Fredericton, NB * Dec 1973 * vp * (Saint John River Basin Board report, no 2A)

This document contains appendices to one of a series of studies commissioned by the Saint John River Basin Board as part of its program for preparing a water management plan for the basin. Appendix A provides temperature, precipitation and streamflow data; the procedure involved in extension of records test on the significance of the extensions, and the results of statistical analysis are presented. Appendix B provides definitions of statistical parameters and their significance as used in the study. A description of the regression analysis used in relating streamflow characteristics to physiographic parameters is also given. Appendix C lists physiographic parameters for individual grid squares. Appendix D describes the regionalization of mean annual runoff, and Appendix E the regionalization of seasonal and monthly flow and variability of annual flow. Appendix F contains the mathematical derivation and description of models for generating monthly streamflow at gauged and ungauged locations in the basin. Two models for the generation of daily streamflows are also described. Finally, Appendices G and H detail the regionalization of flood flows and low flows.

752 (039691)
DEPARTMENT OF THE ENVIRONMENT, INLAND WATERS DIRECTORATE * ***Flooding in the Saint John River Basin*** * Saint John River Basin Board, Fredericton, NB * Dec 1973 * 99p * (Saint John River Basin Board report, no 3)

A study of the seriousness of flood problems in the Saint John River Basin and the possible means of alleviating them has been commissioned by the Saint John River Basin Board as part of their program to develop a management plan for the basin. The results of the study are the subject of this report. The report is presented in the format of an introduction and five chapters. The scope and organization of the study are discussed in the introduction. Chapter 1 is devoted to a history of flooding in the basin and includes the results of a detailed review of past newspapers, files of government agencies, municipal records and other publications. Chapter 2 discusses the causes of flooding, including the hydrology associated with damaging floods and the problem of ice jams, while chapter 3 deals with flood damages and the flood damage potential in specific parts of the basin. Chapter 4 presents the results of a preliminary examination of the various alternative methods which might be used to limit future flood damages. Chapter 5 presents the conclusions of the study and suggests action in dealing with flood problems.

753 (070465)
MONTREAL ENGINEERING COMPANY LTD. * ***Water quality in the Saint John River Basin*** * Saint John River Basin Board, Fredericton, NB * Mar 1975 * vp * (Saint John River Basin Board report, no 4)

The assessment of water quality data is a vital function in the development of a multiuse plan for the Saint John River Basin, New Brunswick. This report gives a preliminary assessment of available data on water quality as it has existed since the 1950s while concentrating on more recent, comprehensive data collected as part of the basin study. It is organized into four parts: discussion of the historical aspects of water quality; review of the quality of the main stem of the river by parameter; review of the major inputs to the main stem including waste discharges and tributaries; and an appraisal of the headponds and major lakes from the water quality standpoint. Principal findings and recommendations are detailed. The manner in which the large volumes of water quality data was manipulated is described in the appendix. The report concludes that the most serious concerns with respect to water quality in the Saint John River Basin centre on the three main stem head ponds as a result of the organic waste loadings discharges to the upper reaches of the river.

754 (018226)
NEW BRUNSWICK DEPARTMENT OF AGRICULTURE; MONTREAL ENGINEERING COMPANY LTD. * ***Agriculture and water management in the Saint John River Basin, volume 1*** * Saint John River Basin Board, Fredericton, NB * Nov 1972 * 341p * (Saint John River Basin Board report, no 5a)

This report is part of a study examining agriculture and water management in the Saint John River Basin. Part 1 of this volume presents a description and the historical background of the basin, while part 2 considers climate and land in the basin. Parts 3 and 4 examine agriculture in the basin and its impact on the water resource. This volume concludes with a look into the requirements of agriculture from the water resource.

755 (018212)
NEW BRUNSWICK DEPARTMENT OF AGRICULTURE; MONTREAL ENGINEERING COMPANY LTD. * ***Agriculture and water management in the Saint John River Basin, volume II*** * Saint John River Basin Board, Fredericton, NB * Apr 1974 * 271p * (Saint John River Basin Board report, no 5b)

This report discusses and describes agriculture and water management in the Saint John River Basin. Part 6 of this volume presents as complete a picture as possible of the agribusiness in the basin, while part 7 concerns itself with the social aspects of agriculture in the basin. Part 8 examines present markets and future market potential for New Brunswick produce. Agricultural policy and the Saint John River Basin is considered in part 9. The report concludes with part 10 putting forward recommendations for water management in agriculture.

756 (039687)
SEHEULT, L.R. * ***The forest industry and water management in the Saint John River Basin*** * Saint John River Basin Board, Fredericton, NB * July 1974 * 67p * (Saint John River Basin Board report, no 6)

The Saint John River Basin carries almost 50% of the standing volume of timber in the province. The forests of the basin are better from the point of view of the user. The average volume per acre is higher, and there is a larger proportion of mature timber. This means a more economical operation and more satisfactory results. According to the Forest Resources Study, "to protect the quality of water in streams, the operation of logging machinery should be allowed only by special permission. The present regulation that all logging debris be kept out of streams and rivers should be consistently enforced." The Forest Resources Study recommends a rapid speeding up of the Forest Extension Service programme to take advantage of the opportunities which are available to wood lot owners.

757 (018225)
METH, F.F. * ***Fishes of the Saint John Estuary*** * Saint John River Basin Board, Fredericton, NB * Dec 1971 * 57p * (Saint John River Basin Board report, no 7a)

This report is a catalogue of the fishes of the Saint John Estuary. The report includes family summaries, species account, erroneous reports, a glossary of terms, and a table of catches. Two species were notable by their virtual absence from the catches: the Atlantic salmon (Salmo salar) and the striped bass (Morone saxatilis).

758 (018224)
METH, F.F. * ***Sports and commercial fisheries of the Saint John Estuary*** * Saint John River Basin Board, Fredericton, NB * Mar 1974 * 63p * (Saint John River Basin Board report, no 7b)

This report, the second in a series describing the fisheries task of the Saint John River Basin Study, is a compilation of relevant information relating to fisheries, both recreational and commercial, within the estuary of the Saint John River. The estuary proper is defined as that portion of the basin which is exposed to the flow and ebb of tide. In the Saint John River, this tidal influence extends to McKinley Ferry, a point several hundred yards downstream from the Mactaquac power development. The entire drainage basin below this point is considered in this report, even though the upstream reaches of the tributaries entering the estuary are not under tidal influence. The report consists of a review of all existing fisheries and the management procedures which have been applied to those fisheries. Using a survey completed during 1971 as a basis, the possibilities of other fisheries are explored. In addition, all major tributaries are assessed as to their potential production of Atlantic salmon. In view of the recent alarm with respect to mercury concentrations in various freshwater fish, samples of fish from the estuary were analyzed and the results are presented herein.

759 (018223)
METH, F.F. * ***Fishes of the upper and middle Saint John River*** * Saint John River Basin Board, Fredericton, NB * Nov 1973 * 45p * (Saint John River Basin Board report, no 7c)

This report is the third in a series describing the fisheries resource of the Saint John River Basin, and comprises a catalogue of species which occur in the basin above the estuary (the estuary is here defined as that portion of the basin subject to the ebb and flow of tide, and extends to a point approximately one mile downstream from the Mactaquac Dam). The drainage area of this portion is about 73% of the total basin area; that is, about 15 500 mi^2 (39 680 km^2). Of this, only 31% lies in New Brunswick, while 20% is in Quebec and 49% in Maine. The emphasis of this investigation is on the New Brunswick portion of the basin, although information from the Quebec and main portions has been included in a cursory way where it was available.

760 (018222)
METH, F.F. * ***Sports and commercial fisheries of the upper and middle Saint John River*** * Saint John River Basin Board, Fredericton, NB * Mar 1973 * 60p * (Saint John River Basin Board report, no 7d)

This report is the fourth in a series describing the fisheries resource of the Saint John River Basin, and focuses on that portion of the basin above the estuary. (The estuary extends from the mouth of the river to a point several hundred yards downstream from the Mactaquac Dam.) This portion has been subdivided for purposes of fisheries analysis, into a middle basin extending from the head of tide to the cataract at Grand Falls, and an upper basin extending from Grand Falls to the headwaters. A more complete description of these portions of the basin and the reason for the subdivision may be found in the previous report entitled Catalogue of Middle and Upper Basin Fish Species. As was the case in the second report of this series entitled Status of Estuary Fisheries, this report reviews all existing fisheries and management of them. A survey of the area under consideration was carried out in 1972, and the availability of unexploited fisheries was investigated. Atlantic salmon investigations are summarized. Heavy metal and pesticide analyses were also carried out, but complete results from these analysis were not available at the time of writing and will be included in the final report of the toxic pollutants task.

761 (038692)
METH, F.F. * ***Fishery management in the Saint John River Basin*** * Saint John River Basin Board, Fredericton, NB * July 1974 * 31p * (Saint John River Basin Board report, no 7e)

The Saint John River Basin Board has commissioned a study of the fisheries of the Saint John River Basin. The objective of this study is "to describe the existing supply of and the demand for the fisheries resource of the estuary, main stem and tributaries of the basin". The following points have been formulated to fulfill the objective: identify all components of the fisheries resource within the basin; identify those components which are currently under- or over-exploited; identify conflicts between current or projected resource exploitation and the maintenance of the fisheries resource; analyze current fisheries management as it applies to the fisheries resource of the basin and identify opportunities for management; determine the potential of tributaries of the Saint John River below Grand Falls for production of Atlantic salmon; make specific recommendations; and determine the fish production of Mactaquac head pond.

762 (018178)
CHOATE, J.S. * ***Wildlife resources of the Saint John River Basin, New Brunswick*** * Saint John River Basin Board, Fredericton, NB * Jan 1973 * 135p * (Saint John River Basin Board report, no 8a)

This report presents the results of a study examining the wildlife resources of the Saint John River Basin. Topics dealt with include background information, wildlife habitat (aquatic wildlife, furbearers, upland wildlife, unique rare, and endangered species and nongame species). The report then considers the human-related factors that affect wildlife and its use including factors affecting the resources and factors influencing use of the resource. A summary and recommendations follow. The five appendices of the report deal with nomenclature, nondomesticated plants of scientific or commercial value and geological formations, land capability classification for waterfowl, aquatic habitat of the Saint John River and land capability classification for ungulates.

763 (069286)
PEARSE BOWDEN ECONOMIC CONSULTANTS LTD. * ***The economics of wildlife in the Saint John River Basin*** * The Saint John River Basin Board, Fredericton, NB * Nov 1973 * 93p * (The Saint John River Basin Board report, no 8b)

This report documents the full range of uses which are made of New Brunswick's wildlife resources, the values people attach to those uses, and the resulting economic impact. Current uses and values of New Brunswick's wildlife resources are categorized as follows and briefly reviewed: recreation, illegal hunting; trapping and guiding; aesthetic, research, and biological values. Data are presented relating to the present level of activity in each of these areas to future activity, and estimates are given of current and predicted primary values. Government revenues from the wildlife resource are given as well as management costs and estimates of secondary economic activity generated by primary resource uses.

764 (018177)
MONTREAL ENGINEERING COMPANY LTD.; RESOURCE ASSOCIATES LTD. * ***Mineral development and water management in the Saint John River Basin*** * Saint John River Basin Board, Fredericton, NB * June 1972 * 103p * (Saint John River Basin Board report, no 9)

This report presents: 1. a review of existing and potential mines, including: (a) assessment of water quality data pertinent to these operations, (b) evaluation of their economic and social aspects, (c) assessment of their water demands and waste control methods, (d) definition of the present impact of mining on the basin; 2. delineation of areas of mineralization, showing areas and types of potential mining operations, and assessing their unit water demands, waste control methods and unit discharges; 3. a review of markets and market forecasts for minerals found in the basin, identification of development alternatives inferred from the market outlook and assessment of consequent social implications; and 4. projection of possible levels of mineral development, their water demands and waste levels. The report is presented in three parts. The first part discusses mineral prospects and potential in the basin. The second part describes existing mineral developments and in particular their water utilization characteristics. Part three describes potential mineral developments in the basin with emphasis on their probable impact on water management.

765 (082278)
HUSTINS, D.G. * ***Tourism and outdoor recreation in the Saint John River Basin*** * Saint John River Basin Board, Fredericton, NB * Sept 1974 * 165p * (Saint John River Basin Board report, no 10)

This report focuses on the Saint John River Basin's existing and potential outdoor recreational resources as they are influenced by, or have an influence on, the water quality and quantity of the basin. It describes and locates the study area, identifies the present status of tourism and outdoor recreation development, indicates present and prospective tourist markets, identifies major adjustments needed to achieve the tourism and outdoor recreation growth potential, and recommends actions necessary if potentials are to be achieved.

766 (018176)
LEWELL, P.A. * ***Outlook for the potato starch industry in the Saint John River Basin*** * Saint John River Basin Board, Fredericton, NB * June 1972 * 87p * (Saint John River Basin Board report, no 11)

The potato starch industry in New Brunswick is a user of water and a fairly major contributor to the pollution load on the Saint John River. This report presents the outlook for the industry in order that the Saint John River Basin Board may assess the problems the industry is likely to present in the areas of water and waste management. Conclusions and findings are presented noting that the outlook for the industry at this time is uncertain.

767 (039686)
PETER MCLOUGHLIN ASSOCIATES LTD., ECONOMIC CONSULTANTS * ***Manufacturing industries and water management in the Saint John River Basin*** * Saint John River Basin Board, Fredericton, NB * Aug 1974 * 227p * (Saint John River Basin Board report, no 12)

This study for the Saint John River Basin Board complements other sector studies. Its terms of reference are specific: "...The economic advisors will carry out studies pertaining to the following aspects of comprehensive basin planning: the future outlook of the manufacturing sector in the basin and the demands and pressures on the water resource consequent upon various types and rates of development in this sector." There are two principal objectives to this report. For the development of economic projections for the basin, detailed assessments of each of the main economic sectors in the basin were needed. Other key areas of the economy required in-depth analysis to help develop these scenarios of the future. This report provides this depth. Secondly, the general manufacturing sector contains a variety of industries which can and do have an influence on the water resource. This report seeks to identify the size and nature of this group of industries.

768 (069287)
HENDERSON, J.M. * ***Municipalities and water management in the Saint John River Basin*** * The Saint John River Basin Board, Fredericton, NB * Feb 1976 * vi, 76p * (The Saint John River Basin Board report, no 13)

Settlement patterns and water use in the Saint John River Basin are described, and implications of these patterns for the development, management and use of the basin's water resources are considered. Population projections are presented relating to the Saint John River Basin Board's five planning regions and to a selection of individual municipalities. Economic trends were examined from three angles: the developing job market; employment trends in the individual municipalities; and employment trends on an industry basis. Recent trends indicate that general manufacturing is growing and can be expected to generate a demand for services in industrial parks. Aspects of municipal financing of water, sewerage and treatment systems are presented. Tax rates and tax base data are summarized as well as capital requirements for waterrelated services. The Community Planning Act is discussed as an effective framework for municipal water management planning.

769 (069289)
SIGVALDASON, O.T. * ***Electric power and water management in the Saint John River Basin*** * The Saint John River Basin Board, Fredericton, NB * Dec 1975 * vp * (The Saint John River Basin Board report, no 14)

This report describes the present and future role of the hydro resources of the Saint John River Basin in meeting the power and energy needs of New Brunswick. The principal features of an electrical generating system are described, including generating and energy storage alternatives, and electrical transmission and distribution systems, and a brief description is also given of how a typical system is planned and operated to ensure a continuing low-cost, secure supply of electrical energy. The historical growth of the New Brunswick system is reviewed, and the projections are made of the growth in electrical demand over the next several years. A description is given of how this demand is likely to be satisfied (including not only increased generating capacity, but also interconnection contracts with neighboring utilities). Specific facilities which have been committed for one-line service within the next few years are described, and the possible future roles for each of the various generating alternatives (hydro, nuclear, thermal, etc.) are discussed. The hydro resources of the Saint John River Basin are described and the overall system expansion is considered. As hydro development must be carried out with due consideration for other water-related purposes, there is also a discussion of flood control, recreation and the effects of thermal plants. The plannings and operation of hydro resources of the Saint John River Basin are conducted in such a way as to ensure that the basin's waters are being used to achieve maximum overall water-based benefits and not simply to optimize energy generation benefits.

770 (018175)
WATT, W.D. * ***Phytoplankton of the Saint John River headponds*** * Saint John River Basin Board, Fredericton, NB * Mar 1974 * 168p * (Saint John River Basin Board report, no 15a)

This report is part of the ecological study of the Saint John River Basin. The first step in the headpond ecology task of the study was the preparation of a systematic catalogue of the headpond phytoplankton communities. A thorough knowledge of the current composition of the phytoplankton communities in each pond provides an ecological baseline from which to measure the effects of any future changes in the pollution.

771 (018213)
WATT, W.D. * ***Summer headpond ecology in the Saint John River Basin*** * Saint John River Basin Board, Fredericton, NB * Mar 1972 * 20p * (Saint John River Basin Board report, no 15b)

This report is part of an ecological study of the Saint John River Basin and presents an examination of summer headpond ecology in the basin. An introduction to ecosystem ecology and effluent ecology precedes the examination of Grand Falls, Beechwood, Mactaquac and Tobique head ponds. It is noted that as eutrophication of a lake proceeds, the yellow perch's temperature preferences enable it to take full advantage of the lake's increased productivity, so the first stages of eutrophication entail a reduced trout population and a much increased perch population. From the point of view of estuary ecology, the headponds probably exert a beneficial influence, affording secondary and some tertiary treatment to the industrial effluents that would otherwise destroy the estuary.

772 (018174)
WATT, W.D.; HARDING, G.H.; CALDWELL, J.; MCMINN, A. * ***Sludgeworms (oligochaetes) as indicators of water pollution in the Saint John River*** * Saint John River Basin Board, Fredericton, NB * Mar 1973 * 31p * (Saint John River Basin Board report, no 15c)

This study is based on samples collected during 1971-72 as part of an ecological investigation of the Saint John River headponds conducted for the Saint John River Basin Board. The oligochaete worms or sludgeworms are a group of annelid worms, many aquatic species of which are adapted to living under conditions of high organic carbon and low oxygen concentrations, conditions characteristic of polluted water. This report deals exclusively with the use of oligochaete worm data for indexing level of water pollution.

773 (018173)
DUERDEN, F.C.; MCMINN, A.; HARDING, G.H. * ***Zooplankton of the Saint John River headponds*** * Saint John River Basin Board, Fredericton, NB * May 1973 * 49p * (Saint John River Basin Board report, no 15d)

As a first step in the ecological study of the headponds of the Saint John River Basin, a systematic catalogue of the phytoplankton community was prepared (Watt 1971). The present report catalogues the members of the zooplankton community of these headponds. The zooplankton are important as they are involved in the consumption, utilization and eventual transformation of phytoplanktonic organic matter in the processes of secondary production. A knowledge of the zooplankton standing stock and production is necessary for an understanding of the ability of different types of water to produce and maintain populations of particular abundance and composition. These considerations prompted the investigations into the composition of the zooplankton populations in the headponds of the Saint John River Basin.

774 (018172)
DUERDEN, F.C.; MCMINN, A.; KEACHIE, P. * ***Macrobenthos of the Saint John River headponds*** * Saint John River Basin Board, Fredericton, NB * July 1973 * 74p * (Saint John River Basin Board report, no 15e)

This report discusses and describes the macrobenthos of the Saint John River headponds. The use of some members of the benthic community as pollution indicators appears promising. Field and lab techniques are presented as is a species list and their headpond occurrence. A glossary of biological terms is provided in the report. The benthos taxonomy is then presented followed by a systematic index.

775 (018216)
WATT, W.D. * ***Aquatic ecology of the Saint John River - volume I*** * Saint John River Basin Board, Fredericton, NB * Oct 1973 * 112p * (Saint John River Basin Board report, no 15f)

This report, volume I of a study of the aquatic ecology of the Saint John River Basin, considers the chemical and physical background and properties of this river system. Specific testing points were selected along the river basin in order to gather data on aspects such as water temperature, light penetration, chlorophyll, phytoplankton, plankton and macrobenthos. Field and laboratory methods are described, as is nutrient chemistry and primary production. Graphs and tables illustrate findings.

776 (018215)
WATT, W.D.; DUERDEN, F.C. * ***Aquatic ecology of the Saint John River, volume II*** * Saint John River Basin Board, Fredericton, NB * Mar 1974 * 112p * (Saint John River Basin report, no 15g)

This report, volume II of a study of the aquatic ecology of the Saint John River Basin, deals with zooplankton, macrobenthos, productivities of sucker and herring fry and presents ecosystem models of carbon balance. This volume of the study contains the conclusions and appendices.

777 (069290)
GILLIS, G. * ***An ecological survey in the Saint John Estuary*** * The Saint John River Basin Board,

Fredericton, NB * Oct 1974 * viii, 64p * (The Saint John River Basin Board report, no 15h)

A biological and chemical assessment was made in 1972 of changes in parameters affecting the aquatic ecology of the Saint John River estuary, particularly those changes directly related to man's activity. The estuarial survey consisted of diurnal oxygen and temperature observations, chlorophyll a determinations, as well as water chemistry, salinity and bottom sediment nutrient analysis. For the summer survey, monthly water samples were taken at six fixed sites in deep areas of basins in the estuary. A late-winter survey was carried out at sites around the Grand Bay portion of the estuary. Results from the summer survey showed no major pollution problem in the Saint John River estuary nor was any oxygen depletion problem observed in the areas of the estuary surveyed. Analysis of results of the winter survey suggest that all areas surveyed are areas of some environmental stress. Further study is required to distinguish between a man-made stress and natural stress. The survey found no evidence of a late-winter plankton bloom in the area, and there was no evidence of major nutrient pooling.

778 (018214)
KEACHIE, P.M.; CÔTÉ, R.P. * ***Toxic pollutants in the Saint John River Basin*** * Saint John River Basin Board, Fredericton, NB * Nov 1973 * 179p * (Saint John River Basin Board report, no 16)

This report presents the results of a study examining toxic pollutants in the Saint John River Basin. Chapter 1 gives a description of the Saint John River Basin itself, while the second chapter examines the chemical properties and biological effects, as discussed in the literature, of the major groups of potentially toxic pollutants in the Saint John River. Chapter 3 surveys the sources of potentially toxic substances in the Saint John River Basin and attempts to estimate the amounts present in the water or at least to state data available from chemical analyses on the quantities of these substances in the water and in biota at various trophic levels. In chapter 4 a summary is presented. It is noted that biologically significant concentrations of toxic pollutants in the Saint John River result almost entirely from the agricultural and industrial activities of humans living in the basin. Chapter 5 concludes the report with some recommendations.

12.2 Nova Scotia Coastal Drainage / Réseau côtier de la Nouvelle-Écosse

12.2.1 Shubenacadie-Stewiacke River Basin / Bassin des rivières Shubenacadie et Stewiacke

Final report / Rapport définitif

779 (058589)
SHUBENACADIE-STEWIACKE RIVER BASIN BOARD * ***Final report, Shubenacadie-Stewiacke River Basin Board*** * Nova Scotia Department of the Environment * 1981 * 73p

This report presents a summary of the results and conclusions of a water management study by the governments of Canada and Nova Scotia. The study examined the critical problems affecting the water resources of the Shubenacadie-Stewiacke River Basin, developed proposals for interim measures to control critical problems and developed a comprehensive management framework for the basin, that focused on water quality and quantity objectives. The organization and methods of the study are described and some comprehensive river basin management concepts are related. Available information on the quantity and quality of water and related wetlands in the Headwaters, Enfield-Shubenacadie Corridor and Stewiacke management areas is summarized. The nature of current and projected water uses is outlined by management area, as well as those uses related to water that may affect its quantity or quality. Urban and rural residential developments, agriculture, mining, forestry, outdoor recreation and fish and wildlife are the principal resource uses discussed. The acid rain phenomena and the issues and opportunities associated with water management in the basin, are summarized by management area.

Summary report / Sommaire

780 (058590)
SHUBENACADIE-STEWIACKE RIVER BASIN BOARD * ***Final report, Shubenacadie-Stewiacke River Basin Board, executive summary*** * Nova Scotia Department of the Environment * (1981) * 25p

This report presents a summary of the method, findings and recommendations of a study of the

Shubenacadie-Stewiacke River Basin by the governments of Canada and Nova Scotia. The objectives of the study are listed and the findings are reported by management area. The most important conclusion was that the majority of critical problems in the basin are in the embryonic stage of evolution. However, available evidence suggests that many of these problems will grow significantly in the future unless corrective management action is taken. The recommendations of the study are listed, however, no requirements for sweeping changes in the existing water management framework were found. It is the Board's view that current deficiencies can be remedied by incremental changes to current legislation and administrative procedures. Appendices list technical reports of the Board as well as its recommendations.

Miscellaneous reports / Rapports divers

781 (036811)
MORANTZ, D.L. * ***A review of existing information on the fisheries of the Shubenacadie-Stewiacke River Basin*** * Shubenacadie-Stewiacke River Basin Board * Apr 1978 * 58 p * (Technical report, no 1)

An evaluation of the Shubenacadie-Stewiacke River fisheries was commissioned by the Shubenacadie-Stewiacke River Basin Board. The purpose of the project is to identify the current supply and demand relationships for sport, and to a lesser extent, commercial fish species in these waters, and to predict possible future changes in the status of these fisheries. This paper deals with the first task in the overall project, a review of existing information on the river basin fisheries. Information presented here has been gathered both from the literature and through personal contact with individuals closely associated with the Shubenacadie-Stewiacke River systems, particularly fishery officers and fishermen.

782 (037469)
HART, W.C.; SCOTT, R.S.; OGDEN, J.G. * ***A phosphorus loading model for lakes in the Shubenacadie headwaters*** * Shubenacadie-Stewiacke River Basin Board * Apr 1978 * 34 p * (Technical report, no 2)

Seven lakes in the Shubenacadie-Stewiacke River Basin were sampled between April and October 1977. Water samples were analyzed for nutrients, chlorophyll and major ions. These data were used to modify a predictive model presented by Dillon and Rigler (1975). Application of the model to the lakes studied suggests that domestic sewage wastes associated with predicted population growth in the area will cause these and other lakes in the headwaters region to become less valuable as recreational and water supply resources over the next ten years. Recommendations are presented which would (1) refine the predictive nature of the model for Nova Scotian lakes and (2) decrease the impact of domestic wastes on fresh waters.

783 (069318)
HART, W.C.; SCOTT, R.S.; OGDEN, J.G. * ***A phosphorus loading model for lakes in the Shubenacadie : headwaters, appendices*** * Shubenacadie-Stewiacke River Basin Board * May 1978 * vp * (Technical report, no 2)

Detailed information is presented in six appendices on lake water samples, precipitation samples, heavy metal analyses, and stream samples collected between April and October 1977 in the Shubenacadie-Stewiacke River Basin. Sampling and chemical methodology are described and nine bathymetric maps are included.

784 (037468)
BEKE, G.J.; WEBB, K.T. * ***A survey of the soil-erodibility (K) factor for representative soils from the Shubenacadie River-Stewiacke Corridor area*** * Shubenacadie-Stewiacke River Basin Board * Apr 1978 * 25 p * (Technical report, no 3)

Surface and subsurface materials from the Shubenacadie River-Stewiacke Corridor area, Nova Scotia, were evaluated for organic matter content, particle size distribution, structure, and permeability. The results obtained were used to predict the soil erodibility K factor of the universal soil loss equation. Average K factors for ice deposited surface materials generally had a narrower range than those for water-lain deposits. Average K factors generally increased with decrease in-site drainage.

785 (037472)
GELFAND, DERRY AND ASSOCIATES LTD. * ***A study of residents' attitudes in the Shubenacadie-Stewiacke River Basin region*** * Shubenacadie-Stewiacke River Basin Board * May 1978 * 57p * (Technical report, no 4)

This report details the findings of a study to evaluate residents' attitudes towards utilization of the land and water resources in the region drained by the Shubenacadie-Stewiacke system of Nova Scotia and their perception of problems related to the utilization of these resources. Specific objectives of the study were to identify the positive or negative environmental factors that contribute to or detract from the quality of life; to evaluate residents' perception of the importance, utilization and abuse of the region's resources; and to evaluate residents' attitudes toward culpability and required remedial action.

786 (037471)
TRUITT, P.G. * ***Prediction and control of soil erosion from land development*** * Shubenacadie-Stewiacke River Basin Board * May 1978 * 70 p * (Technical report, no 5)

This report is an investigation of the practical applicability of the universal soil loss equation (USLE) to erosion control in developing areas of the province of Nova Scotia, focusing on the Headwaters region of the Shubenacadie River Basin. The USLE technique is outlined in the report, allowing the identification of potential sediment source areas; the evaluation of those

sources areas; and the design of adequate control measures needed to reduce potential soil loss.

787 (036805)
MORANTZ, D.L. * ***The fisheries of the Shubenacadie-Stewiacke River Basin*** * Shubenacadie-Stewiacke River Basin Board * May 1978 * 70 p * (Technical report, no 6)

The status of the fisheries of the Shubenacadie-Stewiacke River Basin was assessed from information gathered during a literature search and field work conducted in 1977. The basin and its fisheries can be separated geographically into three parts: the Shubenacadie Headwaters lakes, the Shubenacadie River system and the Stewiacke River Basin. The important commercial fisheries in the Shubenacadie-Stewiacke River estuary are gaspereau, shad, striped bass, and salmon, with gaspereau being the largest of these fisheries (over 340 000 kg caught in 1977). Fisheries' regulations favor the salmon sportfishery and, therefore, in an indirect manner, prevent large commercial catches of salmon. This project has been designed to review existing information and produce additional data on the various sport and commercial fisheries of these rivers and their tributaries.

788 (036806)
WALLER, D.H. * ***Water quality impacts of agriculture in the Shubenacadie-Stewiacke River Basin*** * Shubenacadie-Stewiacke River Basin Board * May 1978 * 56p * (Technical report, no 7)

The body of this report presents and discusses estimates of pollutant discharges in the Shubenacadie-Stewiacke River Basin and deals with the subjects of groundwater quality impacts and agricultural water demands. Appendices include supporting calculations and descriptions and discussion of methods considered and used for estimating pollution discharges. Also it was necessary, as part of this study, to analyse census and other data and to develop sediment production estimates.

789 (037467)
THOMPSON, B.D. * ***An investigation of meguma bedrock leaching in the Shubenacadie-Stewiacke River Basin*** * Shubenacadie-Stewiacke River Basin Board * Aug 1978 * 48 p * (Technical report, no 8)

Fish kills and deteriorated water quality in the Shubenacadie River are related to the mineralized slates of the Halifax formation. The predominant oxidation reaction appears to be biological. Indications are that the most effective remedial action is to remove the source of air by sealing exposed rock surfaces using clay or asphalt. More stringent regulations and monitoring will be required in the future to prevent environmental damage.

790 (036810)
MUDROCK, A.; SANDILANDS, R. * ***Geochemical analyses of lake bottom sediments in the Shubenacadie headwaters*** * Shubenacadie-Stewiacke River Basin Board * Aug 1978 * 89p * (Technical report, no 9)

An environmental survey of the Shubenacadie River headwaters was carried out in 1974 to define the impact of land use activities in the basin on water quality, to characterize the water quality of the aquatic system, and to assess the ability of the water resources to accommodate the rapid urban expansion occurring in the Headwaters region. After evaluation of the data obtained for the water resources study, a recommendation was made to sample the lake bottom sediments for the analysis of nutrients and metals, and to estimate the possible significance of these elements within the lake environment. This report summarises the results and interpretations of a lake sediment survey.

791 (069326)
Proposed surface water quality objectives and groundwater quality objectives for the Shubenacadie-Stewiacke River Basin * Shubenacadie-Stewiacke River Basin Board * Dec 1978 * xix, 121p * (Technical report, no 10)

This report recommends specific surface water quality objectives for the four management areas of the Shubenacadie-Stewiacke River Basin (Headwaters, Enfield-Shubenacadie Corridor, Tidal and Stewiacke Valley) and for the ground water of the Shubenacadie-Stewiacke River Basin. The objectives are summarized in table form and the conceptual framework of a plan for establishing these objectives is explained. Appendices present the scientific information used in establishing the water quality objectives for the following designated water uses: public water supply; aquatic life; agricultural water supply; wildlife; aesthetics and recreation; industrial water supply; and pesticides. Relevant references are included in each appendix. Specific recommendations are presented for sampling, preserving and handling samples and for analyzing samples in the application of the objectives for this river basin.

792 (036813)
HENDERSON, J.M. * ***The effects of forest operations on the water resources of the Shubenacadie-Stewiacke River Basin*** * Shubenacadie-Stewiacke River Basin Board * Aug 1978 * 127 p * (Technical report, no 11)

There is no evidence that forest operations in the Shubenacadie-Stewiacke River Basin are causing any severe problems to the water resource at the present time. Road construction activities, skidding operations and some clear-cutting operations will cause significant erosion and sedimentation of streams. It is necessary to install a mechanism to reduce such damage to the minimum. Statutory controls are considered to be undesirable because they will be unpopular, will not motivate the operators and are difficult and costly to enforce. An ongoing program of education, extension and monitoring is recommended instead. It is also recommended that members of the industry and the public

should be involved in the development of the guidelines and the monitoring of the results.

793 (036809)
BYERS, J.W. * ***Hydrometeorological study of the Shubenacadie-Stewiacke River Basin*** * Shubenacadie-Stewiacke River Basin Board * Aug 1978 * 114p * (Technical report, no 12)

The purpose of the study is to calculate the water budget for the major watersheds in the Shubenacadie-Stewiacke River Basin. It is a continuation of the Shubenacadie headwaters environmental survey of 1974. Streamflow data from the Water Resources Branch, Inland Waters Directorate, and meteorological data from the Atmospheric Environment Service for the year 1977 are used. Lake levels were recorded and were taken at lake outlets. Additional discharge measurements were taken late in the season by a hydrometric technician of the Water Resources Branch for the purpose of obtaining sufficient or additional measurements for a stage discharge relationship at some sites. These late measurements measured some high flows that could not be obtained in the summer. The selection of sites for lake level gauges and for streamflow measurements was decided chiefly on the requirements of the Water Quality Sampling Program. Some additional lake levels and streamflows were taken to aid in the calculation of water balance of the whole headwaters basin.

794 (037466)
HART, W.C.; COLLINS, T. * ***A conceptual model of water use in the Shubenacadie-Stewiacke River Basin*** * Shubenacadie-Stewiacke River Basin Board * Aug 1978 * 14p * (Technical report, no 13)

A conceptual model of the factors influencing the water quality and quantity of the Shubenacadie-Stewiacke River Basin is presented with a feasibility study of further computer modeling of the basin. It is concluded that, at the present time, further modeling would not be cost-effective, although thought should be given to collecting those data which might be used in such a model in the future.

795 (037470)
JOHNSON, P. * ***Water quality of ten Shubenacadie headwater lakes: a preliminary assessment*** * Shubenacadie-Stewiacke River Basin Board * Oct 1978 * 137p * (Technical report, no 14)

This report refers to a water quality study of ten selected lakes within the Shubenacadie Headwaters in 1976. The study was geared toward adding to a pre-existing data base, the identification of respective trophic states and the detection of cultural influences. Observations in the report exhibit the influence of human activity on the subject lakes. Recommendations are made with respect to particular water quality problems noted in individual lakes. The names of the lakes and their trophic states include Cranberry Lake - eutrophic; Loon Lake, Lake Thomas, Kinsac Lake, Springfield Lake - mesotrophic; Lake Charles, Lake William, Lake Fletcher, Grand Lake - almost oligotrophic with mesotrophic tendencies; and Rocky Lake - oligotrophic.

796 (036808)
O'BRIEN, M.; HUDGINS, E. * ***Wetlands and wildlife management in the Shubenacadie-Stewiacke River Basin*** * Shubenacadie-Stewiacke River Basin Board * Oct 1978 * 28 p * (Technical report, no 15)

This project was initiated to identify and inventory the wetlands of the Shubenacadie-Stewiacke River Basin and to evaluate their importance to wildlife. Under a classification system, wetlands are broken down into classes and subclasses according to the dominant life form of vegetation present and the depth and permanence of surface water. Other components of the system include size categories, topographic and hydrologic location, surrounding habitat types, proportions and interspersion of cover and water, and vegetative interspersion. When combined with wetlands juxtaposition and water chemistry, these components provide the criteria for wetland evaluation. Through a system of specifications and ranks, wetlands can then be arrayed according to their wildlife value.

797 (036812)
ARNFAST, D.E.; STACKHOUSE, S.J.; TAIT, J.C. * ***Effects of flooding on agricultural landholders in the Stewiacke River Basin*** * Shubenacadie-Stewiacke River Basin Board * Nov 1978 * 44p * (Technical report, no 16)

The purpose of this study is directed toward examining the flood and flood-related problems faced by farmers bordering on the Stewiacke River and its major tributaries. Specifically, this study has been commissioned to evaluate the extent of flood damage to agricultural land bordering on the Stewiacke River; estimate the current dollar loss of crops due to flooding; estimate the dollar value of agricultural potential lost due to flooding; measure the public cost of payments made to agricultural landowners as a result of flooding; and survey opinions of landowners regarding flood and flood-related problems.

798 (036807)
MONTREAL ENGINEERING COMPANY LTD. * ***Mining activity and the impact on water resources of the Shubenacadie-Stewiacke River Basin*** * Shubenacadie-Stewiacke River Basin Board * Nov 1978 * 36p * (Technical report, no 17)

This report outlines the extent of mining activities and their impact on water quality and quantity in the Shubenacadie-Stewiacke River Basin. The objective of the report is to provide information on abandoned, current and potential mining activity in the river basin and its impact on water resources. The purposes of the study were to identify existing and future surface and groundwater requirements for mining activity; to identify existing and potential effects of mining activity on surface and ground water quality and quantity; to summarize recommendations that have been identified on ways and means to meet mining water requirements

and mitigate potential or existing adverse effects of mining activity on surface and groundwater; and to identify existing and potential water management problems associated with existing and potential mining activity.

799 (037442)
Water supply and wastewater disposal management * Shubenacadie-Stewiacke River Basin Board * Nov 1978 * 176p * (Technical report, no 18)

This publication reports on the optimum management of water supply and wastewater disposal throughout the Shubenacadie-Stewiacke River Basin in Nova Scotia. The first part of the report presents a summary of available information relevant to population, existing water and sewerage infrastructure, surface water quantities and qualities, groundwater locations, availability and characteristics. Each section of the report is developed to provide estimates of future conditions as the basis for the consideration of alternate solutions and systems for the optimum management of the basin. Recommendations are presented at the end of the report.

800 (037443)
PREEPER, B.J. * ***The Shubenacadie Canal System*** * Shubenacadie-Stewiacke River Basin Board * Feb 1979 * 31p * (Technical report, no 19)

This study on the Shubenacadie Canal in Nova Scotia reports on ownership in and around various locks, water rights, and from a legal aspect, historical and recreational possibilities. It is assumed for the purposes of this study that the Shubenacadie Canal is a present and future source of recreational possibilities. The report concludes with recommendations concerning the development and protection of historical and recreational resources of the canal.

801 (037444)
MARITIME RESOURCE MANAGEMENT SERVICE * ***Streambank erosion in the Shubenacadie-Stewiacke River Basin*** * Shubenacadie-Stewiacke River Basin Board * Jan 1979 * 29p * (Technical report, no 20)

This report documents the stream bank erosion problem of the Shubenacadie-Stewiacke River Basin, with emphasis on erosion in the Stewiacke watershed. The study reports on the process of stream bank erosion, the interrelationships of flooding, erosion and sedimentation in the Stewiacke, environmental effects of sedimentation and erosion, in terms of agriculture, fisheries, public services, water quality and recreation, and the impact of channelization and the installation of ripraps.

802 (069337)
MARITIME RESOURCE MANAGEMENT SERVICE * ***Water-based recreation in the Shubenacadie-Stewiacke Basin: opportunities, standards and problems*** * Shubenacadie-Stewiacke River Basin Board * Jan 1979 * 30p * (Technical report, no 21)

This report identifies existing and potential water-based recreation resources in the Shubenacadie-Stewiacke basins, discusses water quality standards and criteria for water-based recreation, and examines how this use of the water affects, or is affected by, other uses. Information gathered through interviews and by a search and review of pertinent literature is presented on maps at two scales: a 1:125 000 scale map shows relevant information throughout the basin; and the headwaters area is further mapped, with relevant information and detail added, on a series of four 1:25 000 NTS planimetric base maps.

803 (037445)
Alternative water supply systems in the village of Waverley * Shubenacadie-Stewiacke River Basin Board * Jan 1979 * 16 p * (Technical report, no 22)

This publication reports on the quality of water supplied to the village of Waverley, in Nova Scotia, which is situated in the Headwaters area of the Shubenacadie River Basin, between Lake William and Lake Thomas. There are 51 buildings where concentrations of arsenic in excess of 0.04 mg/L have been recorded in the wells serving these buildings. Consideration is being given to supplying these dwellings with treated piped water obtained either from Lake William or drilled wells located south of the village and east of Fish Lake. Details of each alternative and corresponding estimated capital, operating and maintenance costs are developed and presented in the report.

804 (037451)
WINTER, J.R. * ***Socio-economic characteristics of the Shubenacadie-Stewiacke River Basin*** * Shubenacadie-Stewiacke River Basin Board * Mar 1979 * 147 p * (Technical report, no 23)

The economics for river basin planning are described under the following areas: water use, externalities and economic efficiency; water management areas and economic efficiency; institutional arrangements for water use; and management sub-areas for the Shubenacadie-Stewiacke River Basin. Projected growth of the population is estimated. The basin economy is discussed, and assessed land values, labor force, industry, forestry, mining and agriculture are highlighted. The methodology of population estimates and land uses as a percent of the sub-basin area from 1964 to 1974 are appended.

805 (037448)
LAY, T. * ***Groundwater survey-field investigations Shubenacadie-Stewiacke River Basin Nova Scotia*** * Shubenacadie-Stewiacke River Basin Board * Mar 1979 * 81p * (Technical report, no 24)

This study was initiated as a supplement to the 1977 study entitled Groundwater Resources Study, Shubenacadie-Stewiacke River Basin System. This report outlines existing information pertaining to surficial and bedrock hydrogeology, chemical analysis of surficial and bedrock well water samples, test hole drilling, production well drilling and test pumping.

Conclusions and recommendations are drawn as to the availability and utility of surficial and bedrock groundwater resources in the study area. Existing reports and government and company files have been used to provide data on which to make decisions on further water quality and quantity exploration activities. Fourteen test hole locations have been selected within the communities of Lantz-Elmsdale, Enfield and Hardwoodlands. An assessment is made of surficial and bedrock potential in the Shubenacadie to Milford and Milford station areas.

806 (037447)
PREEPER, B.J. * ***The Shubenacadie-Stewiacke River Basin institutional study*** * Shubenacadie-Stewiacke River Basin Board * Jan 1979 * 323p * (Technical report, no 25)

This study has been commissioned to look at the present status of water law in Nova Scotia and to look at possible institutional arrangements for water management. It mentions the fact that much of the water law is controlled by legislation. Many quotes are taken from this legislation. After studying the various technical reports that have been prepared for the Board, the study matches the present status of the law with the questions raised in the reports. In conclusion, the institutional question is discussed and the problems from the technical reports are categorized. Various solutions to handle the problems in a systematic and all-inclusive fashion are also included.

807 (040064)
LAY, T. * ***Groundwater resources Shubenacadie-Stewiacke River Basin*** * Shubenacadie-Stewiacke River Basin Board * May 1979 * 114p * (Technical report, no 26)

The purpose of this study is to obtain facts pertaining to the groundwater resources within the Shubenacadie-Stewiacke River Basin system. This report encompasses previously researched and compiled information along with data from recent studies. The terms of reference are to identify the major aquifers in the basin and to summarize their present water quality and quantity; to identify existing pollution sources and identify potential encroachments on existing water supplies; to review available data pertaining to the Windsor aquifer and to identify areas worthy of consideration for development; to identify additional groundwater information which will assist water resource planners; and to prepare a report, including a map, which visually summarizes this information. A separate evaluation of groundwater reserves and description of existing types of supply systems is provided for individual communities and areas. Summaries of pertinent meteorological data are appended to this report.

12.3 Newfoundland and Labrador Coastal Drainage / Réseau côtier de Terre-Neuve et du Labrador

12.3.1 Waterford River Basin / Bassin de la rivière Waterford

Relevant reports not funded by The Canada Water Act / Rapports pertinents financés par d'autres sources que la Loi sur les ressources en eau du Canada

808 (072366)
BATTERSON, M.J. * ***Surficial geology of the Waterford River Basin : St. John's, Newfoundland*** * Government of Newfoundland and Labrador, Department of Environment, Water Resources Division, St John's, Nfld; Environment Canada, Inland Waters Directorate, Dartmouth, NS; National Water Research Institute, Burlington, Ont * 1984 * 29p * (Urban hydrology study of the Waterford River Basin technical report, no UHS-WRB 1.1)

The Waterford River Basin is situated in the path of the rapid urban expansion of Mount Pearl and St John's, Newfoundland. The consequent modification of the drainage pattern and the water geochemistry has offered an opportunity to undertake a detailed examination of the effects of urban development on drainage basin hydrology. The study of the surficial geology is but one aspect of the Waterford River Basin Urban Hydrology Study. The overburden in the Waterford River Basin is generally thin (0-5 m), and is composed of a very compact, poorly sorted lodgement till with high (10%) silt-clay content overlain by a till deposit that is looser, coarser and more permeable in nature, derived by supraglacial or melt-out processes. Water movement is largely determined by the overburden mantle, so the surficial geology is an important component of any hydrological study. Hydrologically, the most significant features of the surficial mantle are its thinness and the influence of bedrock upon drainage, and the slow percolation and discharge of water through the compacted lodgement till unit. Urban development affects discharge by reducing lag times for entry of water into the drainage system which, consequently, increases the potential for flooding and erosion, as well as altering water geochemistry. These effects will become progressively emphasized unless preventative measures are implemented.(au)

809 (072365)
KING, A.F. * ***Geology of the Waterford River Basin : St. John's, Newfoundland*** * Government of Newfoundland and Labrador, Department of Environment, Water Resources Division, St John's, Nfld; Environment Canada, Inland Waters Directorate, Dartmouth, NS; National Water Research Institute, Burlington, Ont * 1984 * 25p * (Urban hydrology study of the Waterford River Basin technical report, no UHS-WRB 1.2)

All rocks within the Waterford River Basin are of latest Precambrian age (circa 700-600 Ma). Bimodal volcanic rocks of the Harbour Main Group occur west of the watershed and are overlain within the basin by three contrasting clastic sedimentary assemblages, which, in order of decreasing age, are the Conception, St John's, and Signal Hill groups. These groups are subdivided into nine formations, which have been traced throughout the area. The rocks provide evidence of two phases of deformation. The first phase is assumed to be related to the Precambrian Avalonian Orogeny and the second to a major Siluro-Devonian (circa 395 Ma) disturbance - the Acadian Orogeny. Hydrologically, the most significant features influencing groundwater movement in the basin are major plunging folds and fracture zones in low porosity rocks of the Drook Formation which generally slope toward the Waterford and South Brook rivers. Tufaceous siltstones (Mistaken Point Formation) and black shales (St John's Group) conformably overlie the Drook Formation in the Mount Pearl area; both rock units show fractures and slaty cleavage which provide conduits for groundwater movement. Secondary growths of pyrite and pyrolusite are commonly altered to iron and manganese precipitates along fractures, particularly in the cherts of the Drook Formation and the thinly bedded sandstones of the Renews Head Formation, and are known to have an adverse effect on water quality.(au)

810 (072364)
ENVIRONMENT CANADA, INLAND WATERS DIRECTORATE (ATLANTIC), WATER PLANNING AND MANAGEMENT BRANCH * ***Waterford River Basin urban hydrology study : land use project*** * Government of Newfoundland and Labrador, Department of Environment, Water Resources Division, St John's, Nfld; Environment Canada, Inland Waters Directorate, Darmouth, NS; National Water Research Institute, Burlington, Ont * 24 June 1986 * 27p * (Urban hydrology study of the Waterford River Basin technical report, no UHS-WRB 1.3)

This report summarizes land use patterns and trends in the Waterford River Basin (St John's, Newfoundland) during the period 1973-84. The land use study was carried out as part of the Waterford River Basin Urban Hydrology Study. The report provides statistics for six broad land use categories: (i) agricultural; (ii) residential; (iii) forest; (iv) other. It also highlights areas of most extensive change, and discusses the interrelationships among the observed uses.(au)

811 (072363)
ARSENEAULT, R.A.; POLLOCK, T.L.; RATNAM, S.; HANSEN, D. * ***Surface water quality study in the Waterford River Basin*** * Government of Newfoundland and Labrador, Department of Environment, Water Resources Division, St John's, Nfld; Environment Canada, Inland Waters Directorate, Darmouth, NS; National Water Research Institute, Burlington, Ont * July 1985 * 91p * (Urban hydrology study of the Waterford River Basin technical report, no UHS-WRB 1.4)

This report summarizes surface water quality observed in the Waterford River Basin during the period 1980-84. This water quality study was carried out as part of the Waterford River Basin Urban Hydrology Study. The report presents data summary statistics for stations situated in wooded, agricultural, light industrial, residential, and urban areas. Surface water quality differences and variations observed in these various regions, both within and between rain events, are interpreted. The adequacy of the sampling and analytical scheme adopted is discussed in relationship to future studies in Newfoundland.(au)

812 (072362)
MARSALEK, J.; PANU, U.; NG, H.Y.F. * ***Storm runoff study of Newton urban catchment*** * Government of Newfoundland and Labrador, Department of Environment, Water Resources Division, St John's, Nfld; Environment Canada, Inland Waters Directorate, Darmouth, NS; National Water Research Institute, Burlington, Ont * Mar 1985 * 122p * (Urban hydrology study of the Waterford River Basin technical report, no UHS-WRB 1.5)

A study of urban runoff in the St John's area was conducted as part of comprehensive investigations of the effects of urbanization on water resources in the Waterford River Basin, Newfoundland. The main objective of this study, which included both field and analytical investigations, was to develop principles of hydrological design of urban drainage in Newfoundland. In field investigations, rainfall, runoff and its composition were monitored in a 13 ha residential subdivision in the St John's area. The collected data were used to evaluate three runoff computational procedures: the rational method, the Illinois Urban Drainage Simulator (ILLUDAS) and the Storm Water Management Model (SWMM). Each of these procedures produced good results within their operational limits. The rational method somewhat underestimated the observed or extrapolated runoff peak flows. Satisfactory results were obtained by applying this method in conjunction with locally derived composite runoff coefficients and inlet times, and a partly contributing catchment area. Both runoff hydrograph models, the ILLUDAS and SWMM, reproduced the observed runoff hydrographs fairly well. The modelling results were particularly good for intermediate storms during which practically all runoff was generated on impervious elements. Only for a few most severe storms was it necessary to improve the modelling results by

accounting for antecedent moisture conditions. Observed characteristics of runoff quality indicated pollution arising from urban activities. Such indications were particularly strong for zinc and lead whose concentrations exceeded the safe guidelines for aquatic life. Recommendations for addressing runoff problems in future urban developments were given. These included various runoff management strategies and technical guidelines for drainage design.(au)

813 (074429)
ROBINSON, J.W.; GIBB, J.E. * ***Groundwater in the Waterford River Basin*** * Government of Newfoundland and Labrador, Department of Environment, Water Resources Division, St John's, Nfld; Environment Canada, Inland Water Directorate, Dartmouth, NS; Environment Canada, National Water Research Institute, Burlington, Ont * Aug 1985 * ix, 134p * (Urban hydrology study of the Waterford River Basin, technical report, no UHS-WRB 1.6)

Ground water is the major portion of water that is retained in any watershed. As part of the overall study of the effects of urbanization on the water resources of the Waterford River Basin, the bedrock and surficial geology of the basin were described and five land use activities were determined. Seven well sites were chosen to monitor the impact of these land uses on the quality of ground water. At each site a deep well and a shallow water table well were constructed. One of the sites was located in the undeveloped natural area of the basin and was used as a control site for the study. In each of these wells the water level was measured monthly and a quarterly water sample was obtained for analyses. An additional site was chosen within the basin, at which the water level was monitored continuously in both a shallow and a deep well. During the five years of the study, no effects could be clearly attributed to the various land use activities, with the exception of road salt stockpiling and application. Further monitoring is recommended for another five years.(au)

814 (072367)
ROBINSON, J.W. * ***Installation and testing of the monitoring well network*** * Government of Newfoundland and Labrador, Department of Environment, Water Resources Division, St John's, Nfld; Environment Canada, Inland Waters Directorate, Dartmouth, NS; National Water Research Institute, Burlington, Ont * June 1986 * 124p * (Urban hydrology study of the Waterford River Basin technical report, no UHS-WRB 1.7)

As an integral part of the Canada-Newfoundland Waterford River Basin Urban Hydrology Study, 13 monitoring wells were constructed to determine the effects of urbanization on the quality of ground water in the basin. These wells also helped to characterize the geology, groundwater flow systems and the hydraulic character of the bedrock and overburden formations. This report presents the results of the four-stage project: planning, installation, hydraulic testing, and water quality testing. Emphasis is on water quality testing and each site was chosen for determining water quality not the hydraulic properties of the aquifers. The monitoring well network provided sampling stations from which representative groundwater samples were obtained and was designed to reflect the effects of the major land use categories on the groundwater quality. Hydraulic testing was used to determine the relative ease with which a potential contaminant could be transported in the groundwater system. A comparison of sampling methods revealed that they had little effect on the value of most parameters. The Kemmerer sampling method was considered adequate for obtaining groundwater samples if the sample is obtained at the same depth as the contributing fracture.

815 (072369)
STIRLING, B.; CLEMENS, T. * ***Biological indicators of water quality in the Waterford River System*** * Government of Newfoundland and Labrador, Department of Environment, Water Resources Division, St John's, Nfld; Environment Canada, Inland Waters Directorate, Dartmouth, NS; National Water Research Institute, Burlington, Ont * Nov 1986 * 157p * (Urban hydrology study of the Waterford River Basin technical report, no UHS-WRB 1.8)

The benthic invertebrates of the Waterford River system were sampled, using artificial substrates, in December 1984 and 1985, with the objective of identifying indicator communities for water quality and to further assess the deterioration of water quality in that system. A diverse insect community, with a small number of individuals per species, was found to be indicative of clean water, while sites with poor water quality were observed to support communities dominated by a few species with large numbers of individuals. South Brook, the main tributary of the Waterford River, was found to contain relatively clean water, while that of the Waterford River itself was only fair to poor. An unnamed tributary, running through the Canada Department of Agriculture experimental farm was found to have fair water quality upstream of the experimental farm and extremely poor water quality downstream.(au)

816 (072368)
BRIMLEY, W.A. * ***Waterford River Basin urban hydrology study : data summary report*** * Government of Newfoundland and Labrador, Department of Environment, Water Resources Division, St John's, Nfld; Environment Canada, Inland Waters Directorate, Darmouth, NS; National Water Research Institute, Burlington, Ont * Mar 1987 * 2v (389p) * (Urban hydrology study of the Waterford River Basin technical report, no UHS-WRB 1.9)

All data collected under the direction of the Subcommittee on Hydrometric Tasks for the Waterford River Basin Urban Hydrology Study have been assembled and reproduced for use by any follow-up studies on the subject. Data in the summary include precipitation, temperature, snowfall accumulation, discharge, water levels and suspended sediment.(au)

817 (076191)
NEWFOUNDLAND DEPARTMENT OF ENVIRONMENT AND LANDS, WATER RESOURCES DIVISION; ENVIRONMENT CANADA, CONSERVATION AND PROTECTION, INLAND WATERS DIRECTORATE, WATER PLANNING AND MANAGEMENT BRANCH * ***Evaluation of urbanization effects on storm runoff characteristic in the Waterford River Basin : (application of the HYMO model) : volume 1 (main report)*** * Water Resources Division, Department of Environment, Government of Newfoundland and Labrador, St John's, Nfld; Inland Waters Directorate, Environment Canada, Government of Canada, Dartmouth, NS; National Water Research Institute, Government of Canada, Burlington, Ont * Apr 1988 * v1 (viii, 93p) * (Urban hydrology study of the Waterford River Basin technical report, no UHS-WRB 1.10)

The Government of Canada and the province of Newfoundland agreed to undertake a five-year urban hydrology study of the Waterford River on a work-shared basis starting in April 1980. The study contained a number of components. For this component, a simple single event hydrologic model (HYMO) was applied to attempt to discern if urbanization between 1973 and 1981 was having a significant impact on peak flows resulting from rainstorms. Estimates of 20- and 100-year peak flows were made for the flood study component, and an indication was provided of the potential effects on peak flows of further development in the study area.(au)

818 (076190)
NEWFOUNDLAND DEPARTMENT OF ENVIRONMENT AND LANDS, WATER RESOURCES DIVISION; ENVIRONMENT CANADA, CONSERVATION AND PROTECTION, INLAND WATERS DIRECTORATE, WATER PLANNING AND MANAGEMENT BRANCH * ***Evaluation of urbanization effects on storm runoff characteristics in the Waterford River Basin : (application of the HYMO model) : volume 2 appendices*** * Water Resources Division, Department of Environment, Government of Newfoundland and Labrador, St John's, Nfld; Inland Waters Directorate, Environment Canada, Government of Canada, Dartmouth, NS; National Water Research Institute, Government of Canada, Burlington, Ont * Apr 1988 * v2 (viii, vp) * (Urban hydrology study of the Waterford River Basin technical report, no UHS-WRB 1.10)

The Government of Canada and the province of Newfoundland agreed to undertake a five-year urban hydrology study of the Waterford River on a work-shared basis starting in April 1980. The study contained a number of components. For this component, a simple single event hydrologic model (HYMO) was applied to attempt to discern if urbanization between 1973 and 1981 was having a significant impact on peak flows resulting from rainstorms. Estimates of 20- and 100-year peak flows were made for the flood study component, and an indication was provided of the potential effects on peak flows of further development in the study area.(au)

819 (072357)
ENVIRONMENT CANADA, ATLANTIC REGION, INLAND WATERS DIRECTORATE, WATER PLANNING AND MANAGEMENT BRANCH; NEWFOUNDLAND DEPARTMENT OF THE ENVIRONMENT, WATER RESOURCES DIVISION * ***Waterford River Basin flood study*** * Government of Newfoundland and Labrador, Department of Environment, Water Resources Division, St John's, Nfld; Environment Canada, Inland Waters Directorate, Dartmouth, NS; National Water Research Institute, Burlington, Ont * Dec 1986 * 2v (212p) * (Urban hydrology study of the Waterford River Basin technical report, no UHS-WRB 1.11)

The Government of Canada and the province of Newfoundland agreed to undertake a five-year urban hydrology study of the Waterford River on a work-shared basis starting April 1, 1980. This component of the overall study determined the 1:20 and 1:100 year return period open water flood profiles using the HEC-II hydraulic model and identified flood-prone areas along the Waterford River. The design flows used as input to this study were determined using the HYMO hydrologic model in another component of the Waterford River Study and the subject of a separate report. The flood-prone areas are shown on the maps inserted at the end of the report.(au)

820 (076471)
NG, H.Y.F.; MARSALEK, J. * ***Streamflow modelling in the Waterford River Basin using the HSPF model*** * Government of Newfoundland and Labrador, Department of Environment, Water Resources Division, St John's, Nfld; Environment Canada, Inland Waters Directorate, Dartmouth, NS; Environment Canada, National Water Research Institute, Burlington, Ont * Mar 1987 * 54p * (Urban hydrology study of the Waterford River Basin technical report, no UHS-WRB 1.12)

The hydrologic modelling of streamflow in the Waterford River Basin has been conducted as part of comprehensive investigations of the effects of urbanization on water resources in the basin. Using a detailed input data base, continuous simulation of streamflow in the study area has been done by means of the HSPF model distributed by the US Environmental Protection Agency. The model has been calibrated using 29 months of data from the input data base. Model calibration against such data has been done in three stages for the annual water balance, seasonal/monthly streamflows, and peak flows from individual large storm events. On the average, the differences between the observed and simulated results were less than 15% and such an agreement was classified as good to very good. The calibrated HSPF model has been applied to several future land use scenarios. It was noted that future

urban development in the study basin is unlikely to increase the annual volume of streamflow, but would contribute to increases in peak flows and the incidence of flooding. If the impervious area in the basin is doubled, the peak flows may increase by about 20%. The calibrated HSPF model may be retained for future analysis of water resources in the Waterford River Basin.(au)

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